WITHDRAWN

THE
DUBLIN QUARTERLY JOURNAL
OF
MEDICAL SCIENCE.

AUGUST 1, 1866.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*On the Operation of Trephining in Cases of Fracture of the Spine.* By Robert M'Donnell, M.D., F.R.S.; Surgeon to Jervis-street Hospital; Lecturer on Surgery in the Carmichael School of Medicine; Examiner in Surgery in the Queen's University.

In the number of this Journal, published at this time last year, I offered some observations on a case of fracture of the spine in which I performed the operation of trephining. I briefly alluded in that communication to a case in which Dr. Gordon had performed this operation. Dr. Gordon's case, which has proved successful as regards the patient's life, was communicated to the Royal Medico-chirurgical Society of London in November last, and as the full details of it will be published in the forthcoming volume of the *Medico-chirurgical Transactions* I shall here only notice the leading features of it.

In my former communication I confined myself to a discussion of the general question as to whether the operation of trephining the spine should be adopted in certain cases, or whether it was to be set aside altogether as an operative procedure, as it practically has been for many years past. I am very well aware that not a few distinguished surgeons are of opinion that it should be set aside altogether; but I also know that there are many who coincide with me in thinking that this operation should be acknowledged in certain cases to be justifiable; that it should not be taught in our schools as a matter of course—that in all cases of fractured spine it is worse than useless, and not to be thought of; but, that the proceeding of trephining the spine should be permitted to take its place among the legitimate operations of surgery as one which, although formidable, and in most cases not likely to prove successful, nevertheless offers, in certain cases, by far a better prospect of saving life than the system of doing nothing.

In the present paper I purpose to consider the special circumstances and symptoms which appear to indicate cases favourable for the operation, or the reverse; and finally the method of performing the operation in the different regions of the spine. Before, however, entering on the consideration of these topics I may be allowed to add a few observations in reply to some objections which have been raised to the operation of trephining the spine.

Case I. (Dr. Gordon's Case).—Michael Clinton, a slight and well-made, although rather pallid and wasted, man, of thirty-one years of age, was admitted to the Whitworth Hospital, under Dr. Gordon's care, on May 30th, 1865. For some years he had been employed as an engineer on railways in the United States, and describes himself as having been an active, healthy person up to the 27th of March last, when he met with an accident of which he gives the following account:—While hunting, his horse shied at a fence, and he was flung off into a gripe on his back, which came in contact with some stones; immediately his lower limbs were paralysed; he made an effort to get up, but found that he was completely powerless from the waist down. He was carried home in great pain; for four or five days he had retention of urine, requiring the introduction of the catheter; at this period the distention of the bladder caused him acute pain; after this the urine began to dribble away; it became, as he says, "very offensive, and full of corruption-like matter."

From the first he had paralysis of the sphincter ani, with involuntary passage of feces. For five weeks after the accident he was not conscious of sensation in the lower limbs; he had occasional priapism.

After admission to hospital he was carefully examined; his condition at that time was noted as follows:—In the lower limbs muscular power is entirely lost so far up as the knees; except the sartorius, the muscles of the thigh have little or no power; he has no power over either the bladder or rectum.

Sensation is lost in both feet; from the ankle to the knee he feels obscurely, the left leg being almost devoid of sensibility. There is hyperesthesia of each thigh—on the right side to so great an extent that he is distressed by rubbing the hand across the surface of it. Below the knee he cannot appreciate the difference between heat and cold: a vessel of warm water, which, applied to the left thigh, is of an agreeable temperature—when applied to the right causes him to cry out that he is burned. He can tell, without seeing them, the position in which the lower limbs are placed. No reflex movements can be excited in any of the muscles below the knees; in each thigh reflex motion can be readily aroused; on the right side the slightest touch of a hair, or even blowing on the surface causes vigorous contractions, especially of the sartorius muscle.

The lower limbs are considerably wasted; there is no œdema of the feet or ankles, which are bedewed with perspiration; the penis and scrotum are large and flabby, but not ulcerated; the orifice of the urethra is inflamed, it is not possible to introduce a double channelled silver catheter (size No. 10); a bed-sore, about the size of half-a-crown, has formed on the back; the urine is alkaline, very muddy and fetid, containing a copious muco-purulent deposit, and tinged with blood.

Upon examining the spinal column, the spinous process of one of the lower vertebræ was found to project considerably. This projection existed at a distance of four inches above a circle made round the body at the level of the umbilicus, and was not movable.

The nature of his case, and of the proposed operative procedure having been explained to the patient, the operation of trephining the spine was undertaken at his request, and was performed on June 3rd, 1865, the patient having been placed under the influence of chloroform. The operation lasted fifty minutes; the amount of blood lost was not considerable.

Fourth day after operation.—Urine became acid.

Fifth day after operation.—Urine again alkaline, scalds him in passing.

Eleventh day.—Had a motion from the bowels, of the passage of which he was perfectly conscious, but unable to control. Urine since last date alkaline; drawn off with catheter.

Fourteenth day.—Urine, when drawn off, acid, and quite free from blood.

Sixteenth day.—Urine slightly alkaline, and continued neutral for three days, when it became acid.

Twenty-sixth day.—Can eject the urine from the bladder; and since the beginning of July the power over the bladder is such as to force the water strongly against the side of the vessel in a full stream, and on one occasion to a distance of between two or three feet; urine persistently acid; the catheter is no longer necessary.

Eight weeks after the operation the patient was able to go out into the open air, reclining on his back in a basket carriage. At this date the bed-sore on the back was quite well, and the wound healed; motion was in an appreciable degree restored in the lower limbs, and sensation much improved; the power over the bladder restored, and the condition of the urine almost natural; the patient's appearance much improved, and his appetite good; a minute portion of bone, weighing a couple of grains, had come away; no abscess had formed; he felt his back so strong that he desired to be allowed to sit up; he could turn himself from side to side readily, and with confidence.

Six months after the operation the report was as follows:—The patient can sit upright without the least discomfort, or feeling of weakness in the back; he makes water, he says, as well as ever he did; he cannot stand, or, of course, make an attempt at walking; and although by forcing he can evacuate the bowels, yet the sphincter ani has not regained its power.

Now (July 9th, 1866) the patient being unable to stand or walk, moves himself about in an invalid chair. He has sought employment as a worker at a steam lathe, at iron-works in the neighbourhood of Dublin.

I must congratulate my friend and colleague, Dr. Gordon, on the measure of success which has attended his operation in this instance. The case is one which will become classical—it has the merit of being, if not the first case of trephining of the spine which has been attended with success as regards the saving of life, recorded in the British Islands, at least the first fully and accurately reported. It has the value which is always attached to a case occurring in an hospital in a large city, and beneath the critical eyes of a large number of students and practitioners.

I conceive that no impartial person will deny that in this case the operative procedure and the improvement which followed it were related to each other as cause and effect. The diminution of hyperesthesia, and of the exalted reflex action—the improvement in the urine, bed-sore, and bladder—the increase of sensibility below the knees, as well as of motor power in the thighs, followed the operation in such a way as to leave little doubt that they were due to it. It is possible, and even probable, that the subsidence of the hyperesthesia and exalted reflex action of the right thigh may have been due, not to the removal of the portion of bone causing pressure or irritation of the cord, but to the counter-irritation produced by the wound beginning to suppurate. This subsidence of hyperesthesia was the earliest sign of amendment, and in consequence of it the patient got great relief from a distressing symptom; but, possibly, active counter-irritation by blisters or issues might have produced a similar result. But this cannot be said for the disappearance of all muco-purulent deposit, and blood from the urine, and the healing of the bed-sore, with, by degrees, the returning acidity of the urine; the perfect power, also, which the patient now has over the bladder must, I conceive, in fairness be attributed to the operation. It is interesting to observe that this power became restored by steps just reversing the order in which it is lost in such cases. The water, instead of constantly dribbling away, became retained—the catheter became necessary for a time, and it gradually became possible to dispense with it altogether.

This case will, no doubt, be regarded very differently by various individuals; some will say, that after all it proves nothing more than that the operation is one not necessarily fatal, but that the patient would probably have made an equally good recovery if not operated upon. If, however, it be admitted that there is nothing in the operation necessarily fatal—if the case shows that extensive suppuration and exfoliation, making convalescence very tedious, if not impossible, are not invariable attendants on the operation, a great step has been gained, and many of the most plausible arguments urged against the operation are answered by this alone. For my own part, however, I am convinced that the patient's life was saved by the operation; he thinks so himself also. He was getting gradually worse up to the time of the operation; after it he steadily improved up to a certain point. Having seen him before the operation, and watched him closely since, I can at least say that I have never met with any case presenting such symptoms as Clinton's, which did not certainly run a fatal course. On the other hand some persons will probably attach to this case even a greater importance than it deserves—that is to say, greater in comparison with cases which have had a less successful issue. They will in short pay the usual tribute to success, and estimate more highly the single fact, that the patient is living twelve months after the operation, than the several facts revealed in a case where marked amendment in different symptoms took place; and yet a *post mortem* examination ultimately showed the exact nature of the injury, and the connexion between the amendment and the operation itself.

Although I am very sensible of the merits of Dr. Gordon's case, yet, I believe, that the instance in which I myself operated is, on this account, more instructive upon some points than his. I may be pardoned for briefly alluding to it:—

CASE II.[a]—Joseph Collins, thirty-eight years of age, was admitted to Jervis-street Hospital on December 28th, 1864, having had his spine fractured by a sack of wheat falling upon him from a height; he had the usual symptoms which accompany this injury.

The posterior arch of the first lumbar vertebra was removed by operation, on February 3rd, 1865.

On the day following the operation a great improvement had taken place in the returning sensibility, and power of motion in the lower limbs. The bed-sores which had formed gradually made good progress; the penis and scrotum, which were œdematous and ulcerated, became reduced in size, and the ulcerations healed; the patient regained some power over the bladder.

He died on the 17th day after the operation, in consequence of abscesses having formed in the kidneys.

The *post mortem* examination also showed that the body of the first lumbar vertebra was fractured, and this vertebra was displaced backwards; the line of fracture separated only a small portion of the body of the broken vertebra. The intervertebral substance between the last dorsal and first lumbar vertebræ had been torn. The dura mater of the cord was uninjured; the portion of it corresponding to the piece of bone removed at the time of the operation was covered externally with lymph; the surface next the cord was healthy; there was no trace of inflammation within the dura mater. The cord was not inflamed or softened; it was indented at a point corresponding to where the bone was displaced.

Although in this case the operation would have been much more satisfactory if the posterior arch of the last dorsal vertebra had also been removed, yet what was done is sufficient to prove that where pressure on the cord is caused by fracture and displacement of the body of the vertebra, benefit arises from taking away the counter-pressure posteriorly; that, in short, removal of the counter-pressure in such cases is enough to enable the spinal cord, in a great degree, to resume its functions. Of course the fact that benefit is gained by taking away the posterior arches, when the cord is subject to compression, in consequence of fracture or displacement of the vertebral body—that motion and sensation in such cases, more or less, completely returns, and ulcerations heal—in short, the evidence thus offered, that the spinal cord, to a certain extent, recovers its powers is more conclusive than any theoretic argument that can be offered on the subject. The following experiment, however, suggested to me by my former pupil, Dr. Alexander Filson, makes very clear the precise mode in which the removal of the posterior arch may relieve pressure on the spinal marrow, even when arising from some cause acting on the anterior portion of the canal. Suppose that a short piece of indian rubber tube, just large enough to fill it, is introduced into the spinal canal, and the body of the vertebra then crushed or broken with a hammer, in such a manner as is shown in the accompanying woodcut—the Indian rubber tube is compressed. If, then, the laminæ be sawn through, and the posterior arch taken away, the indian rubber tube at once recovers its former shape and dimensions. The spinal marrow is not to be supposed to recover itself with the resiliency of Indian rubber, but the experiment illustrates, in a simple way, what the operation hopes

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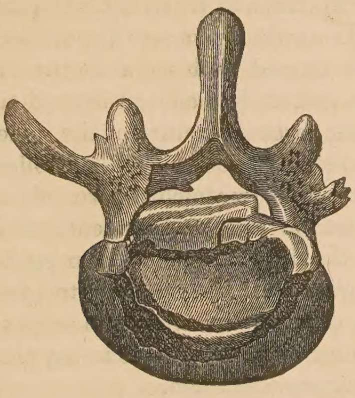
[a] For full details of the case, see the number of this Journal, August, 1865.

Fig. 1.



to accomplish by removing the counter-pressure. Case II. proves that the expectation may be in some degree realized.

One of the questions which Cline proposed to himself before undertaking to trephine for fracture of the spine was whether a patient could recover from a compound fracture of the spine; and later writers upon the subject seem to question the possibility of it. Louis' case, however, shows that such cases are not necessarily fatal.

Case III. (Louis' Case).[a]—M. de Villedon, captain in the regiment of Vaubecourt, received a gunshot wound in the back, when turning to load his gun, at the battle at the bridge of Aménébourg. He fell on the spot, and finding himself paralysed in the lower limbs, he believed that he was mortally wounded. He did not wish to be removed from the place where he fell; but in spite of his entreaties he was conveyed to the hospital at Marbourg, where he was first attended to by M. Duplessis, Surgeon-major. Louis did not see him until the third or fourth day after the injury; M. Villedon was then in a very precarious state, suffering from high fever. It was necessary to introduce a catheter several times a day. He had been bled; the wound enlarged, and the ball extracted. Louis introduced his finger into the wound, and there felt some fragments of bone of considerable size. Louis then says:—" I consulted with my colleague M. Duplessis. He agreed with me as to the imminent danger of the patient, whom, indeed, he believed beyond the reach of aid. I recounted to him the cases of fracture of the spine which I had seen, and the causes of the fatal event which had followed. We drew a parallel as to the mode of treatment of wounds of the head, where one does not hesitate to remove fragments of the cranium which prick or compress the dura mater; we also spoke of the indication for the trephine, even without fracture, to give exit to blood, or matter, or even to prevent suppuration in some cases of fracture. I owe it to the memory of M. Duplessis to say that in this conference our way of thinking was the same.

" The wound was carefully dressed next day; and the spinal marrow having been set free from pressure, and the wound no longer irritated by the fragments of bone, an abundant suppuration became established. The patient appeared better from day to day. The lower extremities recovered their sensibility and some power of movement. Excoriations, the precursors of bed-sores, got well; in fine, M. Villedon recovered. For a long time he could only move about on crutches. He made a journey to Barege; he enjoyed good health, and was at last able to walk with a stick. The lower extremities continued weak, and did not recover their original *embonpoint*, one leg being more atrophied than the other. Quoi qu'il en soit c'est une victime que l'art a soustrait à une mort certaine."

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[a] Archives Générales de Medecine, série 2, Tom xi., 1836, p. 417.

The cases hitherto detailed are, to say the least, calculated to encourage surgeons to follow a bolder line of practice than has been hitherto generally adopted in the treatment of injuries of the spine with pressure on the cord. When it is borne in mind that the mortality from fracture of the spine is so great as to have induced Sir Astley Cooper to say, that to save one life in a hundred would be more than he had seen accomplished by surgery; and when, at the same time, we remember that with the aid of chloroform we are justified in undertaking operations, one of the great arguments against which, in former times, was the suffering entailed by the operation itself, such considerations should embolden surgeons to give a further trial to a proceeding which is not more formidable than many of the recognized operations in surgery.

In forming a judgment on so important a question surgeons will, very rightly, be much influenced by their individual experience. Some who have been more fortunate than their fellows in meeting with cases of recovery when they had reason to believe that the spine was fractured and the cord compressed, will be opposed to the proposed operation. Those, on the other hand, who have met with none but fatal cases, and who retain a lively recollection of the dreadful course of suffering through which such cases pass on the road to death, will be more willing to have recourse to an expedient the results of which for so far are, as I say, encouraging.

In my own experience of cases of fractured spine left to run their own course, I have met with but one in which life was preserved. The case is worthy of being recorded, although not bearing exactly upon the present subject, inasmuch as I conceive that the fracture was below the termination of the spinal marrow, and consequently the symptoms arose from pressure and injury to the cauda equina, not from pressure on the cord itself.

Case IV.—Henry Dalton, formerly a private in the 19th Hussars, twenty-six years of age, was brought under my notice in May last, by Dr. John A. Byrne, physician to the Canal-street

Dispensary. Dalton, who is a remarkably intelligent young man, gave me the following account of his case. Three years ago, when in India with his regiment, his horse, in rearing, fell upon him; as soon as he was disengaged from the weight of the horse he tried to crawl away, but found he could only attempt to do so with his hands and arms, as his legs were totally powerless; in fact he did not feel that his lower limbs were there. He was conveyed to the hospital at Cawnpore, where the surgeon told him that his spine was broken, low down. He was found to be quite paralysed both as regards sensation and motion in the lower limbs; he required the catheter to be used in order to empty the bladder, and he was unable to control the evacuations from the bowels. Apparently some attempt was made at this time to remove, by extension, the deformity of the spine which then existed; for the patient says that he was put under the influence of chloroform several times for some such purpose. His own regiment having left Cawnpore he remained there in hospital for over eight months, under the care of Dr. Meyers of the Royal Artillery, who appears to have devoted very great attention to the case. During this time he regained no power over the lower limbs, neither did sensation improve; he required the constant use of the catheter. No bed sores formed.

His present state is as follows:—

Right leg quite devoid of sensation as high as the knee; obscure feeling of contact of the hand in the thigh, in which, however, he can distinguish the difference between heat and cold distinctly; left lower limb totally devoid of feeling from the groin down.

He can raise the right lower limb by the muscles acting on the upper portion of the femur; the muscles of the leg on the same side are completely paralysed. Muscular paralysis of the left lower limb may be said to be quite complete. Muscles on both sides much wasted. No reflex phenomena can be excited in the lower limbs.

Bladder and bowels are not under the control of the will. He has learnt to introduce a catheter for himself when necessary; urine generally neutral, sometimes alkaline and cloudy with pus. Bowels generally constipated, acting about once a week. When necessary to use aperient medicine he takes sulphate of magnesia in preference to anything else. He desires, however, that the bowels shall be constipated, as he cannot control the evacuations if anything like diarrhea comes on.

He has *referred* sensations of formication in the right foot. The temperature of feet and legs is normal; he looks well in the face, and says that his general health is on the whole good.

On examining his back (of which I have a cast in my possession) the amount of deformity taken in connexion with the history and symptoms, leaves no doubt as to fracture of the spine having taken place. The summit of the most projecting spinous process is exactly two inches above a circle made round the body, at the level of the umbilicus, so that we may presume that it is the third lumbar vertebra which has been broken.

This patient passed blood in the urine for some days after the accident, and still suffers occasionally from pain in the left kidney.

This case is certainly one of interest and importance; yet even if it was clear that in this instance the medulla itself had been injured, such cases would not be sufficient to establish a rule never to be deviated from. It might as well be argued that because instances are recorded of compound fractures of the cranium, with depression of bone, recovering without any attempt having been made to elevate the bone, in no such case should an attempt be made to elevate.

Some persons appear to think that if the spinal medulla has been for a time subject to compression it undergoes some structural change, so that even if relieved from pressure it cannot again resume its functions. Physiology has proved that this is not so; but, moreover, we see, not at all unfrequently, cases of spinal disease in which matter outside of the theca pressing on the cord produces paralysis, and after a time the purulent deposit changing its position or making its exit, the cord recovers, and the paralysis more or less completely disappears.

Case V.—J. M'D., a woman about forty years of age, was admitted to the hospital of the Mountjoy (Female) Convict Prison on February 2nd, 1861. She complained of stiffness in her neck, and had obscure symptoms, leading to the supposition that there existed disease of the cervical vertebræ. On the night of June 23rd she became paralysed; on the following morning I saw her along with my colleague, Dr. Banon. The patient was then totally paralysed, as regards sensation and motion in both arms; in the lower limbs she could feel the contact of the hand when rubbed over the surface, and had a good perception of heat and cold, when vessels containing hot or cold water were applied to the skin; she could not draw up the legs as she lay in bed.

Reflex movements were with difficulty excited in the lower limbs, on tickling the sole of the foot, &c., but no such phenomena could be excited in the upper extremities.

She could not voluntarily evacuate either the bowels or bladder; the former were relieved by enemata, the latter by the introduction of the catheter.

She was perfectly intelligent, and her memory was unimpaired; her speech unaffected; she could swallow without difficulty, and complained only of pains in the lower limbs.

The patient continued in this state for some days. On the 2nd of July, she suddenly underwent a remarkable improvement; she found that she could draw up her legs in bed; she sat up, and and fed herself with her right hand; this she could do while she looked at her hand; but if she looked away the spoon fell from her hand; she then did not know whether it was in her fingers or not. She now drew attention to a tumour, in the back of her throat, which had suddenly made its appearance, and caused her such difficulty in swallowing that she could only get down fluids. This tumour could be felt low down in the back of the pharynx.

The patient got weaker, and gradually sank, exhausted, on April 15th.

At Dr. Banon's request I made a *post mortem* examination.

The brain was healthy; and, on removing the spinal marrow, no pus or other evidence of inflammation was found within the theca. For the length of two inches the spinal cord, at the level of about the fourth and fifth cervical vertebræ, was found somewhat flattened from compression. It appeared to the touch to be softened at this point, but this was only apparent softening from mechanical pressure, for careful microscopic examination showed that the structure was not altered. A considerable quantity of purulent matter existed between the theca of the cord and the bodies of the fourth and fifth cervical vertebræ; and this collection of matter was found to communicate with the tumour felt in the pharynx, which proved to be an abscess at the back of the pharynx and œsophagus.

It appears, in this instance, that the pressure of the matter, formed behind the bodies of the vertebræ, flattened the spinal marrow, and interrupted its functions; yet, when the matter made its way forward to the back of the pharynx and œsophagus, the cord in a great degree resumed its functions; and when the patient died, a fortnight later, no structural change had taken place from which it might not have completely recovered.

In the following case also the cord seems to have recovered itself from the effects of pressure, also resulting from formation of matter outside the theca.

Case VI.—John M'C., 26 years of age, was admitted to the hospital of the Mountjoy Prison, on July 14th, 1865, having commencing caries of the spine, in the lower part of the dorsal region. He became gradually paralysed in the lower limbs, bladder, and rectum. Later, a psoas abscess made its appearance in the left groin; it pointed, and burst. The patient recovered power over the sphincters, and by degrees was able to walk. He left hospital on October 23rd, 1865.

As showing, however, the effects of pressure from a mechanical cause on the spinal marrow, and its capability of resuming its functions when this pressure is removed, the following remarkable case is of paramount interest.

For this case I am also indebted to my friend and colleague Dr. Banon.

John Whitethorn, aged nine years, was admitted to Jervis-street Hospital on July 5th, 1862. He had been playing with some other boys, when he met with a singular accident. The game consisted in running tilt with an old umbrella at a mark upon a wall; as Whitethorn ran forward to strike the mark he was pushed from behind by another boy—one of the wires of the umbrella (one of those which crosses from the sliding ring on the handle to the ribs), being loose, entered the boy's mouth, and was driven through the left side of the soft palate, and into the spine, with force so great as to fix it in it firmly, and snap it across.

Dr. Banon happened to be in the wards at the time when the boy was brought in. He found that the wire had passed through the velum on the left of the middle line, and that it was driven backwards, probably between two of the cervical vertebræ, so as to injure the spinal cord; the wire was not broken off short, but could be seen and caught hold of in the mouth.

The boy's left arm was paralysed, as regards motion, but its sensation was unimpaired; his pulse was 75, weak, and intermittent; there was no paralysis of the bladder, bowels, or lower limbs. It required considerable force to withdraw the wire. At ten o'clock that night the pulse had risen to 112; he could move the left arm, but could not raise it off the bed.

There was fever, with delirium and sickness of stomach for some days; on the 18th the paralysis had almost disappeared—he could extend the arm perfectly from the shoulder.

Later, cerebro-spinal meningitis supervened; then came on severe pains in the neck, followed by vomiting and great restlessness. On the 15th he was roaring with pain, and could not bear to be touched. He became insensible, and died on August 18th, forty-four days after the accident.

The *post mortem* examination revealed considerable effusion at the base of brain, and evidence of meningeal inflammation around the pons, medulla oblongata, and spinal cord. I examined, along with Dr. Banon, the seat of the injury. The track of the wire was followed, as it pierced the intervertebral substance between the third and fourth vertebræ—it had evidently pushed the theca before its point—which was not sharp—and pressed it on the cord, squeezing the latter; the wire had not perforated the theca vertebralis.

Yet, from an injury such as this, the cord recovered itself so quickly when the wire was withdrawn that the same night motion began to reappear, and within a fortnight paralysis had almost totally disappeared.

There is no doubt, as is urged by those who are altogether opposed to the operation of trephining the spine, that it is a general fact that the fragments of the broken vertebræ, which commit the greatest injury to the cord, are usually in front—not behind; and this, as I have already said, seems to be the gravest of all objections which have been offered against the operation; this objection I have attempted to answer in my former communication. I would now merely add that those who put it forward take little or no account of the cases of fracture of the spine, in which the posterior part of the vertebra is broken, and the spinal marrow pressed upon by a portion of bone actually capable of removal. Although such cases may form but a small proportion of the whole number of fractures of the spinal column, yet the records of surgery show that they are, at least, too frequent to be passed over in silence; they are obviously the cases most favourable for the so-called operation of trephining; and a perusal of some of those, which I have here collected from various journals, will, I think, show that among the recorded cases of fractures of the vertebræ there are a good many in which it it would have been good surgery to have performed the operation in question.

The following cases are intended merely to illustrate the fact that the posterior portions of the vertebræ may be broken, yet the bodies escape fracture or displacement more frequently than some persons would have us believe.

Case VII.[a]—On the 1st of May, 1851, during a violent storm of wind and rain, a balustrade fell from the top of a high building, striking a man, named John Larkin, who was about forty years of age, upon the back of his head and neck. He fell to the ground instantly, and did not again move his feet or legs, although he never lost his consciousness, until he died. I found his bladder paralysed also, and his left arm; but his right arm he could move pretty well. He conversed freely up to the last moment, and said that he was suffering a good deal of pain, which was always greatly aggravated by moving, His death took place 36 hours after the receipt of the injury.

Dr. Hugh B. Vandeventer, who was the attending surgeon, made a dissection on the following day in my presence, which disclosed the fact that the plates of the sixth cervical vertebra were broken upon each side, and that the spinous process, with a small portion of the arch attached, was forced in upon the spinal marrow. There was no blood effused, or serum at this point, but about one ounce of serum was found in the cavity of the tunica arachnoides, at the base of the brain. The bodies of the vertebræ were not broken. It was our opinion, therefore, that the immediate cause of his death was the direct pressure of the spinous process.

Case VIII.[b]—A somewhat similar case to the foregoing is recorded by C. J. Weigel. The patient, sixty-eight years of age, fell from a tree and sustained several injuries. He had complete paralysis of the lower limbs immediately after the fall, but the arms did not become paralysed until the following day. Swallowing was attended with effort, and respiration laborious. He died on the second day. The spinous process of the sixth cervical vertebra, with a piece of the arch on each side, was found to be fractured.

Case IX.[c]—W. J. Thomas, of Liverpool, has reported the case of a woman, forty-one years of age, who met with a fracture of the

[a] Hamilton—Fractures and Dislocations, p. 150.

[b] Weigel and Ammon's Monatschrift, Bd. i., 1838, p. 633.

[c] Monthly Archives of Medicine, Vol. i., p. 408.

spine in consequence of falling down a flight of stairs while intoxicated. She died on the fourth day after the accident.

"The arch of the fourth cervical vertebra was fractured at the base of the spinous process. The wing of the right arch was tilted under the spinous process of the third vertebra, and there firmly wedged."

There was no fracture of the bodies, but a separation to some extent, between those of the fourth and fifth cervical vertebræ. On opening the membranes there was no effusion, nor were there any marks of inflammation.

CASE X.[a]—George Jones, aged thirty-two, a large muscular man, was admitted into Rahere's Ward, St. Bartholomew's Hospital, on the night of the 13th June, 1830, with complete paralysis, and loss of sensation of his lower limbs and trunk, as high as the middle of his sternum; his pulse was 76 and soft, countenance calm, intellect perfect, temperature of the lower extremities natural, partial priapism, respiration performed wholly by the diaphragm, but without difficulty. The previous afternoon, whilst driving rapidly a light cart with two men in it, and endeavouring to restrain the horse, the reins broke, and he fell towards the ground, the wheel passing over the back part of his neck; he was stunned, and on recovering found the lower part of his body paralysed. The patient died ten days after the injury. The arch of the sixth cervical vertebra was found fractured. There was slight separation between the seventh and eighth vertebræ. The external appearance of the cord was natural; but on section the medullary matter was found softened. The viscera of the thorax and abdomen were natural.

CASE XI.[b]—J. S., aged 30 years, was injured August 18th, 1850, under the following circumstances. Being engaged in a playful scuffle, he seized his antagonist by the leg, and was in the act of pushing him over backwards; and while in a stooping posture he received a sudden twitch which threw him forwards with considerable violence, the head being flexed upon the chest in such a manner that he struck upon it, and then keeled over. All present agreed that he could not have received any direct blow upon the neck, as the ground was quite smooth. He immediately found

[a] Stafford—Treatise on the Spine, p. 102.

[b] Ladd.—Boston Medical and Surgical Journal, 1852.

himself perfectly helpless. I saw him about three hours after the injury; there was complete paralysis and anesthesia of the body and limbs. He complained of pain through the lower part of the cervical region, extending to the top of the shoulders. There was extreme pain on pressure, but no crepitus or deformity could be detected. On the following morning febrile action set in briskly. It was necessary to introduce a catheter to relieve the bladder, and the bowels acted involuntarily. In a few days the urine became alkaline and loaded with mucus; afterwards purulent, bloody, and very offensive. During the first forty-eight hours he regained the power of slight voluntary motion in the forearm, after which there was no improvement whatever in motion or sensation. In about ten days the fever, for the most part, subsided; the tongue cleaned, and appetite returned, but his flesh wasted rapidly; in fact the vital powers seemed to be slowly but steadily giving way. He now began to get paroxysms of dyspnea, and these became more frequent, until he sank at last, exhausted, thirty-six and a half days after receiving the injury.

Post mortem examination ten hours after death.—The six inferior cervical vertebræ were removed entire, when it was found that the spinous process of the fifth was fractured through the laminæ, and pressed down upon the cord. The fragment was with some difficulty removed, in consequence of the inequalities of the broken surfaces. The cord appeared much flattened, the membranes were entire; on opening the theca the cord was found to be of the consistence of cream at the seat of injury; below this slightly softened.

Case XII.[a]—Joseph Feugré fractured his spine by a fall on his back from a height of about fifteen feet. Five days after the accident he was admitted to the Hospice de la Magdeleine at Rouen. The lower limbs, bladder, and rectum were paralysed.

He died fourteen days after the accident. A portion of the spinous process of the third dorsal vertebra was detached; a fissure passed through the laminæ of the fourth; a considerable effusion of blood occupied the spinal canal.

Case XIII.[b]—Patrick Gallagher, collier, aged thirty-seven, while at work in a coal pit a large stone fell from the roof, struck him on the back, and crushed him. Entire loss of motion and sensation below the seat of injury; retention of urine.

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[a] Histoire de quelques affections de la colonne vertébrale, par Alexandre Demussy, p. 6.

[b] London Medical Gazette. Vol. ii., for Sessions 1843–4, p. 359.

Death seventeen days after the accident.

"Upon removing and sawing the injured part of the spine through the centre from back to front, the intervertebral cartilages between the eighth and ninth dorsal vertebræ were found wanting, having been destroyed by absorption or ulceration. The surfaces of the same vertebræ were bare, soft, and soaked in pus. There was some extravasation between the membranes within the sheath of the cord, and the latter was much compressed and lacerated by a small, thin, pointed fragment of bone, which had been detached from below the base of the spinous process, and driven inwards."

Case XIV.[a]—M. Chappillon met with a case in which a bookseller, M. Duchesne, was injured by a pile of books falling upon him from a height of twenty feet. The patient died sixteen hours after the accident. The spinous processes of the second, third, fourth, and fifth vertebræ were found to be fractured and separated from their bodies; but these latter were not displaced; the fibrocartilages uniting them only, appeared to be more relaxed and movable than they usually are.

Case XV.[b]—Ekstroemer, of Stockholm, has recorded a case of a miller who received a severe injury of the spine in the cervical region by falling headlong from his mill; he had paralysis of the extremities, and of the sphincters, &c., with diaphragmatic respiration.

The spinous processes of the fifth, sixth, and seventh cervical vertebræ were found to be broken, and pressed in upon the medulla.

Case XVI.[c]—Mr. Belcher, of Burton-on-Trent, reports the case of a man, thirty-seven years of age, a sawyer, who fractured his spine by falling backwards from a cart on which he was standing, so that the vertex seemed first to strike the ground.

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[a] Archives Generales de Médecine, 1836. Tome xi., p. 421. M. Louis, who reports this case in this very remarkable memoir, read to the Academy of Surgery on April 18th, 1774, makes the following observations on it:—"Cette blessure a dû paraitre audessus des ressources de l'art; cependant dans un accident aussi fâcheux et tout-a-fait désespéré que risquerait-on a pratiquer une incision par laquelle on pénétrerait jusqu'aux apophyses fracturés, pour debarrasser la moelle epiniére des esquilles qui la blessent, et donner issue au sang épanché?"

[b] Zeitschrift für d. gesammt Medicin. (Hamburger.) Band xiii., 1840, p. 408.

[c] British Medical Journal, 1862., Vol. ii., p. 531.

He died on the fifteenth day.

The spinous process of the first dorsal vertebra was splintered, and a portion detached. The articular processes of the first and second dorsal vertebræ were fractured, and their capsular ligaments torn; the arches of the vertebræ separated to some extent. There was no dislocation or fracture of the bodies of the vertebræ.

Case XVII.[a]—Schallenmüller also gives a case in which the spinous process of the sixth cervical vertebra and the laminæ on each side, at their union with the transverse processes, were broken, the body escaping without fracture or displacement.

Case XVIII.[b]—Louis mentions a case in which the spinous and transverse processes of the sixth and seventh cervical vertebræ were broken without fracture or dislocation of the bodies.

Case XIX.[c]—Boyer narrates the following—" A sack of flour weighing three hundred pounds, fell on the nape of the patient's neck; an acute pain was felt in the lower part of the cervical region. The patient was conveyed to the Hospital of La Charité. On examining him I perceived that the spinous process of the seventh cervical vertebra was more prominent than in the natural condition. The upper and lower limbs were paralysed; respiration laborious; the rectum and bladder incapable of acting. The patient died at the end of five days. At the *post mortem* examination we found a fracture of the posterior arch of the seventh cervical vertebra, with depression of a fragment which pressed on the spinal marrow, and exercised upon it firm compression."

Case XX.[d]—Professor Weber, of Bonn, records the following case.

'A patient, forty-six years of age, was precipitated down a staircase, with a sack on his shoulders, and was immediately brought into the " Klinik," paralysed. Between the fourth and sixth vertebræ of the neck there was to be felt a hollow which could not be removed by cautious stretching of the neck. There was complete paralysis both of sensation and motion of the lower limbs, the bladder and rectum. The urine was drawn off by the aid of the catheter. On the following day the upper extremities also were paralysed, and the patient died fifty hours after the accident. The arch of the fifth cervical vertebra was broken and dislocated so as to compress considerably the spinal marrow. Some inflammation of the membranes extended upwards to the cranium.

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[a] Medic. Correspondenzblatt (Wurtemburg), Band 13, 1843, p. 364.

[b] Archives Generales de Med., 1836, Vol. xi., p. 412, Case v.

[c] Traités des Maladies Chirurgicales. Third Edition. Vol. iii., p. 137.

[d] Chirurg. Erfahr. und Untersuchungen. Berlin, 1859. Page 164.

Case XXI.[a]—Mulder mentions the case of a man aged thirty-eight years, who, from a fall backwards on the ground, fractured the spinous processes of the fourth, fifth, and sixth cervical vertebræ. The bodies were not broken, but the posterior arches were broken into several fragments. The patient lived two days.

Case XXII.[b]—Jaeger reports a case in which the spinous process of the sixth cervical vertebra was fractured by a waggon laden with wood passing over a man's neck. There was no trace of injury done to the skin, but there was great tenderness over the spinous process of the sixth vertebra; the lower limbs were paralysed, and some hours later the arms also. The patient died, convulsed, in eighteen hours. The medulla was torn beneath the fractured portion of the vertebra, and blood was effused within the theca.

Case XXIII.[c]—Mr. Arnott exhibited to the Pathological Society of London a specimen taken from a patient, aged seventy-four years, who died in University College Hospital, on July 30th, 1850. In this case the spinous process of the axis was found broken off, with a portion of its laminæ. The broken off spinous process was much depressed below the others, and wedged in between the axis and the vertebra below.

Case XXIV[d].—This case, reported by MM. Maunoury and

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[a] R. Stroemer, Ueber d. Bruch der Wirbelbeinforsätze. Wurzburg, 1842. P. 12.

[b] Hedinger, Ueber d. Knochenverletzungen, &c. Leipzig, 1833. Page 90.

[c] Lancet, 1850. Vol. ii., p. 588.

[d] Gazette Medicale de Paris, 1842, p. 361.—The reporters of this case add to it the following observation :—" In Bressant's case there was only a fracture of the vertebral lamina, effusion of blood between the dura mater and the bone, integrity of the medulla. " Dans ces cas, si on pouvait pressentir le peu d'etendue de la lesion, que n'aurait on le courage d'aller à la recherche de la fracture, de détacher la lame osseuse, qui comprime la moelle et qui est la cause infallible d'une mort rapide; il a fallu certainement plus de hardiesse pour appliquer plusieurs couronnes de trépan sur le crane, pour faire le ligature des arteres iliaques primitives, et de l'aorte abdominale, pour enlever la matrice en totalité."

Thore, and was one of those met with in the practice of Professor Roux, in the Surgical Clinique of the Hôtel Dieu, in 1841.

Bressant, forty-eight years of age, was brought to the Hôtel Dieu immediately after a fall upon his back from a height of about twelve or fourteen feet. He was stunned, but soon regained consciousness. On admission there was paralysis of sensation and motion, the skin was insensible as far up as the base of the thorax, following a line corresponding with the vault of the diaphragm. The muscles of the forearm were paralysed, respiration diaphragmatic, respiratory murmur normal, pulse quiet, paralysis of the bladder, priapism of which the patient was not conscious.

Death on the sixth day.

There was fracture of the laminæ of the fifth cervical vertebra, the spinous process of which was removed with facility. Beneath the fracture there was some black blood between the dura mater and the bone. The medulla was uninjured. There was also fracture of the sternum or separation between the manubrium and body of that bone.

Case XXV.[a]—A Negro, aged thirty, while wrestling with a companion, was thrown suddenly upon his neck, by having his feet tripped from the ground. The fall was immediately succeeded by a loss of motion and feeling in the shoulders and arms, in the walls of the chest and abdomen, and in the lower extremities. Though there was an entire loss of sensibility to the impression of external agents, he was subject to occasional and severe pains in all the paralysed parts, and to constant and lancinating pains in his arms and shoulders. There was no external mark of injury over the spinous process of the fifth cervical vertebra; but a distinct crepitus was perceptible on pressure. His breathing was short and extremely laborious, being carried on alone by the action of the diaphragm. The muscles of the head and neck, above the origin of the phrenic nerve, maintained their integrity. His pulse and the temparature of his body were unaffected until near the close of life, which occurred within forty-eight hours after the accident. On the day subsequent to the injury he was affected with retention of urine and great abdominal distention; notwithstanding the peristaltic action of the bowels had been excited, and met with no resistance from the paralysed sphincter. There was no distention of the corpora cavernosa.

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[a] American Journal of Medical Science, 1837, Vol. xxi., p. 276.

Dissection.—The rim or arch of the fifth cervical vertebra was fractured in three places, and the spinous process, with a part of the arch, was driven in upon the spinal marrow. There was a slight effusion of blood between the sheath of the spinal marrow and the bone, and a considerable effusion between it and the substance of the cord. There was no material lesion of the medulla or of its investing membranes; and the body of the bone was not fractured or displaced at the intervertebral junction.

CASE XXVI.[a]—A. B., a mason, twenty years of age, while going up a staircase with a hod on his shoulder, made a false step and fell backwards; in the fall the posterior part of the cervical region of the spine struck with violence against the corner of one of the steps.

When carried to the Hôtel Dieu the patient presented the following symptoms:—Paralysis of the limbs; insensibility of the skin, which was cold (especially that of the extremities). His respiration resembled that of a man in a troubled sleep; the pulse was very slow (40 to 50 in the minute); slight drowsiness; voice feeble; he was slow in answering questions addressed to him; his eyelids drooped; there was erection of the penis. The walls of the thorax were immovable during respiration which was performed by the diaphragm.

On the day following the accident deglutition was very difficult; respiration more laboured, especially in the evening; every instant the patient was threatened with suffocation. The priapism was persistent.

A catheter was introduced to draw off the urine, without his perceiving it in the least. Dejections passed involuntarily; pulse small, very slow. All the parts below the lesion of the neck were completely paralysed. The patient understood everything, answered correctly what he was asked, and only complained of the painful feeling of suffocation.

The *autopsy* revealed a fracture, with depression, of the laminæ of the fifth cervical vertebra; the spinal marrow was firmly compressed at the point corresponding, and was reduced to one half its ordinary volume; the substance of the medulla was marked with striæ of blood.

These cases show, if nothing else, at least that instances of fracture of portions of the vertebræ, unaccompanied by fracture or displacement of the body, are not very unfrequent; in fact, I candidly confess, that until I had looked into the published details more carefully than I had hitherto thought of doing, I accepted the assertions of others, and was not prepared to find so many. Those which I have here brought together represent rather more than ten per cent. of the recorded cases upon which I have been able to lay my hands. In the great majority of such cases the fracture occurs in the cervical or upper part of the dorsal region; the reason of which is obvious both from the conformation of the spine and the exposure of these regions to injuries by direct violence. In discussing the question as to whether the operation of trephining the spine is to be admitted among the legitimate and recognized operations in surgery, injuries of the kind above mentioned have a considerable importance. They prove that after all, among the cases of fracture of the spinal column, a goodly per centage are of such a nature that even the sternest adversaries of the operation would admit them not to be unsuitable for it. The question here only turns upon the difficulty of diagnosis.

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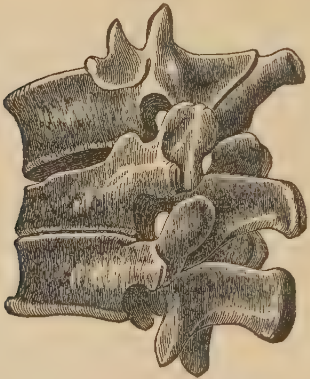
[a] Ollivier. Traité des Maladies de la Moelle Epiniére Third Edition. Paris, 1837. Vol. i., p. 270. Case 9.

The real question as to the fitness or unfitness of any case for operation will, I conceive, depend far more upon the exact amount of injury done to the spinal cord than on whether the fracture engages the portions of the vertebra in front of it or behind. No doubt the operation would have a good chance of being brilliantly successful in such cases as Case VII., XI., XIX., or XX.; but assuredly there are not a few cases in which, although pressure may arise from injury done to the vertebra anteriorly, yet removal of the counter-pressure posteriorly will set the cord free from being squeezed. When the body of a vertebra is broken, and, as usually happens, the intervertebral substance is at the same time more or less lacerated, the progress of the case must be, under the most favourable conceivable circumstances, very tedious. The first thing that nature does is to absorb the lacerated fibro-cartilage, and while this is being accomplished little or no callus is thrown out. I find, however, a considerable number of cases reported in which the body of a vertebra is so injured as to press upon the marrow, although no separation of it into fragments has taken place; neither are the fibro-cartilages torn. The accompanying woodcut, Fig. 2, shows the appearance in a case of this kind mentioned by Professor Middledorpf. The body was flattened by compression so as to bulge backwards into the spinal canal. The spinous process of the vertebra above was also broken.

Fig. 2.



The most remarkable case of this kind that I have seen is one which was communicated to the Surgical Society of Ireland, last March, by Professor Geoghegan,[a] by whose kind permission I

Fig. 3.

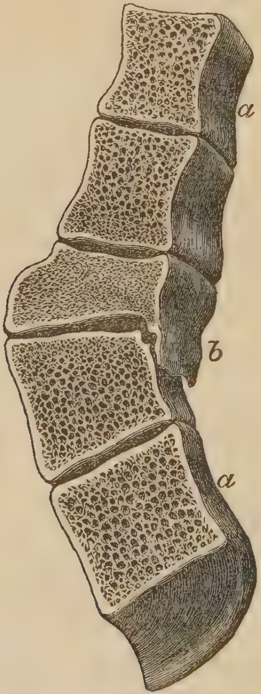


Fig. 3, showing compression of one of the dorsal vertebræ. The bodies of the vertebræ are sawn vertically through the centre, and the section viewed from the anterior aspect, in order to show the exact character of the lesion.

[a] Medical Press and Circular, March 21st, 1866, p. 277.

obtained a woodcut from the preparation. The patient fell into an area on his head; by the indirect violence thus communicated to the spine the fifth dorsal vertebra was compressed in the manner exhibited in the woodcut, Fig. 3. It was in fact flattened so that it bulged backwards, encroaching on the spinal canal. No portion of the vertebra was actually detached, neither was the fibro-cartilage torn either above or below the compressed body.

In injuries of this kind if, by taking away the posterior arch or arches, the pressure on the cord is relieved so as to enable the patient to escape from the immediate risks to life, there may be reason to hope that the patient may ultimately recover, as do cases of curvature of the spine from caries, where the deformity is as great or even greater.

When, in consequence of a fracture of the spine, the marrow is subject to pressure—but not lacerated—it is usual, unless the pressure be so considerable as to destroy both sensibility and motion below the injury, to find that the functions relating to motion are much more affected than those of sensation; the patient cannot attempt to move his toes or feet; cannot draw up his legs in bed, or even push them down if flexed for him, while feeling may be normal even to the tips of the toes; the sphincters may be paralysed, yet the patient distinguishes the temperature of an enema, and complains on the introduction of a catheter; if the spinal marrow be lacerated to any considerable extent, or what is equivalent to laceration, if it has been so roughly compressed as to distintegrate its structure, the case is different—sensation and motor power are then alike lost.

Between these two supposed conditions there are many degrees; and an accurate examination of the symptoms connected with sensation must be the chief aid in making an accurate diagnosis. The amount of sensibility on one side as compared with the other, and estimated by application of the points of a pair of compasses—the appreciation of the sensation of heat and of cold—of contact, of tickling, and of the position of the limbs—should each be looked to. The amount of voluntary power affecting certain muscles will assist in determining the seat of pressure; and if paralysis of motion is found on one side in a degree much more marked than on the other, while sensibility is observed to be greatest in the part where motor power is least, there need no longer be any doubt that the pressure is chiefly exercised on the lateral half of the cord on that side of the body on which the motor paralysis is found to be greatest.

I have lately seen, with Dr. Darby, of Bray, a case in which the pressure caused by the formation of matter strikingly illustrated this fact.

I am indebted to Dr. Darby for the notes of the case.

Case.—Pat Byrne, aged eight years, healthy, active, and intelligent, for some months in the school of the Rathdown Workhouse, was brought under Dr. Darby's notice on the 9th of March, 1866, by his father, who said he had observed the boy for some days past holding his head awry; the boy, on being questioned, said he did not know what had brought it on, and added that he had no great pain—he did not mind it; his head was inclined to the right side, and could not be turned straight; in other respects he appeared healthy; he was ordered to hospital, and directed to take a purgative, and have a warm bath; the head continued awry, but his health continued good; he remained in hospital, and had poultices, leeches, and such care in medical treatment (purgatives, &c.), as the case seemed to require, up to the 25th, when he first complained of want of power, and pain in his right arm. On this day his pulse was quick—tongue clean—appetite good; leeches were applied, and such other treatment as appeared necessary.

On the 10th April his right arm was quite paralyzed, and he showed some febrile symptoms, and a fulness was observed in the right side of the back of the neck.

On the following day I saw the boy along with Dr. Darby. The patient could not make the faintest attempt at moving his right arm, or stir any of the fingers; he could move the left arm freely about, and grasp tolerably firmly with the hand; as to feeling—the symptoms were reversed; in the left hand he could hardly feel at all, so that when the tops of the fingers were tightly pinched he did not wince, while the slightest pressure on the fingers of the right caused him great distress; at this time both sensation and motion in the lower limbs were unimpaired. The opinion formed was, that a deep-seated abscess, possibly connected with diseased bone, was pressing on the right side of the spinal cord in the cervical region. He became worse, and died on May 4th.

An abscess was found to exist, pressing, as had been supposed, on the cord; this collection was partly external to the spinal canal—partly within it; the pus escaped when the vertebræ were being removed; from an examination of the cavity it appeared that, external to the theca, and between it and the bone on the right side, there had been a collection of matter of about the size of a small filbert; this communicated with a larger cavity external to the canal, situated anterior to the transverse processes, and very deep among the muscles of this region.

In seeking to excite reflex movements in the lower limbs of patients suffering from fractured spine the observer is often disappointed in being able to do so, and this too, when the injury is so high up as to lead one to suppose that the lower portion of the cord is intact. Some persons, for whose opinions I entertain the highest respect, regard the absence of the capability of exciting reflex movements in such cases as a proof that the injury is not restricted to a local compression of the cord, "but that it involves also such a molecular disturbance of its structure as appears to be propagated throughout the entire segment of the organ inferior to the direct seat of mischief." Were this view correct, it would appear that a total absence of reflex movements in the lower limbs would indicate an extensive lesion of the medulla, not possible to be removed by getting rid of all pressure at the seat of injury. As I believe, however, that there is another and very different explanation to be offered concerning this symptom (or rather absence of a symptom), I may be pardoned for stating what I conceive to be the true physiological solution of the problem.

When a patient is suffering from inflammatory softening of the spinal cord in the middle of the dorsal region, or higher up, energetic reflex movements can always be excited in the lower limbs by tickling the soles of the feet, plucking the hairs on the inside of the thigh, and so forth. In short, when by disease the lower portion of the spinal marrow is cut off more or less completely from communication with the sensorium the portion so cut off retains its power of giving rise to energetic movements when excited, so as to call its reflex action into play.

What is then the reason that this does not also happen when, by a fractured or displaced vertebra, or pressure from any cause, the lower portion of the medulla is cut off from communication with the sensorium. It must be remembered that in cases of paraplegia dependent on congestion of the spinal cord or its meninges, it is usually difficult and very often impossible to excite reflex movements, and that this constitutes one of the most important diagnostic marks of this form of disease. If, therefore, any mechanical cause gives rise to congestion of the cord, it is reasonable to suppose that a similar state of things will be found to exist.

It is therefore simply venous congestion of the cord, resulting from pressure at the seat of injury, and not a molecular change pervading its whole structure, that causes the possibility of exciting reflex motions to be in abeyance. If this view be correct, so far from being a reason against the operation, the absence of reflex movements is an additional indication of the necessity of, so far as possible, getting rid of mechanical pressure on the cord.

In support of the accuracy of this view it may be mentioned that in injuries affecting the lower portion of the cord it may be found impossible to excite reflex movements in the feet, toes, or muscles of the calf, while stimulation of nerves, whose roots enter the cord above the seat of injury will call forth energetic movements in the sartorius, cremaster, &c.; moreover, if these movements are excessively active it may, along with hyperesthesia of the surface, be taken as evidence that the cord immediately above the injured part is in a state of vascular excitement, tending to inflammation of either the cord or its membranes.

So far as is at present known, the occurrence of priapism does not appear to yield any special information, either as to the precise portion of the marrow injured or the amount of pressure exercised on the cord. It seems to give evidence of excitation of the upper part of the cord, and nothing more. Priapism is mentioned as having taken place in about thirty per cent. of the cases collected by Gurlt, in which the injury occurred above the second dorsal vertebra; when the injury to the cord is lower down it is of much rarer occurrence; and even then, I suspect, is really produced by an excitation of the marrow above the injured part. It is a symptom which is usually transient, seldom lasting more than a day or two, although in some cases persisting for a fortnight, or even longer.

The remarkable increase of temperature noticed in some cases as occurring in consequence of injury of the spinal cord, does not any more than the occurrence of priapism, appear to indicate the exact part injured, or the amount, or nature of the injury. Indeed, it is greatly to be regretted that the cases in which this phenomenon has been noticed have not been more carefully investigated. Sir B. Brodie mentions a case in which the thermometer rose to 111° F., when the bulb was placed between the scrotum and the thigh; he does not state what the temperature was above the injured part. Mr. Butcher, in the account given of his case of dislocation of the cervical vertebræ, without fracture, states that the heat in the lower limbs was absolutely greater than natural. What the temperature was either above the injury or in the lower limbs, is, unfortunately, not stated. To have proved that the blood circulating in the paralyzed parts was absolutely so many degrees warmer than that in the parts above the injury would have been most interesting; it is also to be regretted that among the symptoms noted concerning the same important case no mention is made of the capability of exciting reflex movements in the parts below the seat of injury.

The examination of the spinal column itself at that part where the lesion has taken place may naturally be expected to give much information as to the degree of benefit which may be hoped for from the operation of trephining. The amount of deformity, the degree of tenderness, and general tumefaction—the possibility of detecting crepitation or displacement of the spinous processes will each indicate something in favour of the operation, or the reverse, according to circumstances. The nature of the injury and the exact mode in which the accident happened should be carefully inquired into. It is only necessary to read some of the cases already quoted to see that the close investigation of the precise circumstances of the accident may yield evidence which, taken in connexion with existing symptoms, will aid more than anything else in forming an accurate diagnosis as to the exact nature of the lesion.—(See cases VII. and XXVI.)

If, before the operation be undertaken, there is evidence that myelitis or meningitis has already supervened, it is obvious that little benefit could be expected from the performance of it. If, therefore, the patient complains of the well-known symptoms of feeling as if a cord were tied round the body at the limit of the paralysis, and formication, and "*pins and needles*," not only in the parts still sensitive, but where sensation has been already lost; if there are cramps and spasmodic twitchings in the feet, calves, or abdominal muscles, and if, at the same time, there is an accession of fever, quick pulse, &c., accompanied with excessive sensibility of some portions of the surface, operation need not be contemplated; if it is to be done with a reasonable prospect of success, it must also be undertaken before those changes have taken place which give rise to atrophy of the muscles, bed sores, alkaline, and muco-purulent urine, &c.

There appears to be nothing to contraindicate the free use of chloroform during the performance of the operation. It was administered so as to produce its full effect in the case operated on by myself, in Dr. Gordon's case, and in a third case in which my colleague, Dr. Henry J. Tyrrell, lately performed this operation in Jervis-street Hospital. In all these cases the injury to the spine was low down; although the patients were turned over so as to lie on the front of the body, there was no difficulty experienced in giving it. In Jones's case, where the injury was high up in the dorsal region, and the action of the heart was intermittent, the patient was nevertheless placed under the influence of chloroform, on two occasions, without bad result—once for the purpose of minute examination, and a second time for the operation.

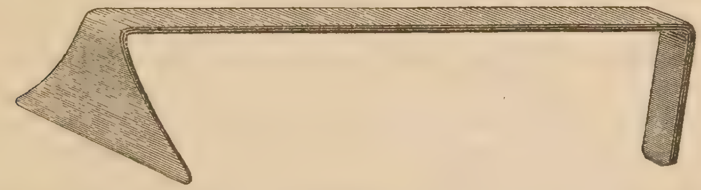
A very considerable number of the recorded cases of fractures of the spinal column show that after death softening of the medulla has been observed at the seat of injury. My own observations, as as well as those of others, have convinced me that in many instances this softening is something different from inflammatory softening on the one hand, and white or atrophic softening on the other. In both, inflammatory and ordinary white softening, it is probable that the nervous tissue has undergone a structural change from which it cannot recover. In that kind of spurious or mechanical softening which the cord undergoes from the pressure of purulent matter, bone, &c., it is quite certain that it can recover; it has undergone no structural change which prevents it, as soon as the removal of pressure permits the circulating fluid to permeate it, and nourish it once more, from recovering itself and resuming its functions. It probably best bears comparison with that kind of atrophic softening which may result from embolism, and which may, if the collateral circulation be so re-established as to restore nutrition to the part, be followed by recovery.

In Cases II. and V. I examined the structure of the medulla with great care, but without finding either exudation granules, or traces of fatty degeneration. The medullary substance was bloodless from pressure, and nothing more; when the finger was passed down gently along the cord, at the part which had been compressed, it felt softer; and when moved between the fingers it felt more limp at that part, yet the microscope gave no evidence that any structural change had taken place. We must not, therefore, suppose that in all the published cases in which softening is said to have occurred that myelitis had taken place.

I have now seen the operation performed three times on patients, and I have performed it many times on the dead subject. The mode of its performance, and the difficulties which are encountered in accomplishing it, vary much in the different regions of the spine, and, of course, in actual practice must vary with the nature of the case and the mode of injury. When the spinous process and laminæ only are broken the whole proceeding will be very simple; but even when this is not the case it may be said, that compared with many of the great operations in surgery, that of trephining the spine is not so formidable as has been supposed.

In the lumbar region and lowest part of the dorsal the operation offers the greatest difficulties. The patient should be placed face downwards, with the feet towards the window, so that the light may fall into the bottom of the wound. The body should be placed as evenly and flat as possible on its front aspect; but the person who gives chloroform can keep the head turned a little on one side, and somewhat raised, by placing one of his hands under the chin. An incision from four to five, or six, inches long is to be made through the integuments over the spines, with a strong scalpel. A strong curved bistoury is the best instrument with which to divide the muscles on each side of the spinous processes; and this can be done, at once, more rapidly, and closer to the bone, by entering the point of the bistoury below and cutting upwards and backwards. As soon as the mass of muscles on each side are to a sufficient extent divided, the operator should fix, himself, on each side, a retractor such as is here represented, Fig. 4, and give each in charge to an assistant.

Fig. 4.



The broad flange of such a retractor not only keeps the wound well open, so that the operator can see what he is about, but by pressure prevents hemorrhage, while the hand of the assistant who holds it does not get fatigued, owing to the other end being bent. The operator should next feel in the sulcus, on each side of the spinous process, for the inequality caused by the injury, and by grasping successively each spinous process, in a pair of necrosis forceps, ascertain whether the posterior portions of any vertebra are broken. He must then determine which laminæ are first to be divided; and before doing this it is well to place sponges, wet with iced water, in the hollows on each side of the spinous processes, and give time for all hemorrhage to cease.

Having singled out the spinous process of the vertebra, the laminæ of which are to be divided, the interspinous ligaments above and below it are to be cut, and a part of the process taken off, with bone forceps, leaving, however, enough to grasp with the necrosis forceps, when it becomes necessary to remove that portion, after division of the laminæ. The division of the laminæ, in this region, is exceedingly difficult. The trephine cannot be used; and Hey's saw, owing to the depth of the wound, and oblique manner in which the bone must be sawn, is also useless. The division is best accomplished by strong forceps bent at an angle, something like the forceps known as "Fergusson's side-cutting forceps." Experience shows that the laminæ may be thus cut through without fear of injuring the cord or its membranes. As soon as this has been accomplished, the portion of the spinous process still remaining is to be caught in a pair of necrosis forceps, and the portion of bone raised and removed by carefully dividing the ligamentous structures still holding it. When the posterior arch of one vertebra has been taken away, the removal of the second is comparatively easy; the best method of effecting this is by nibbling it away bit by bit, with the ordinary gouge forceps.

It is a much easier matter to remove a spinous process, and the laminæ on each side of it, in the middle or upper part of the dorsal region than in the loins. In its preliminary stages the operation is like the foregoing. When the muscles on each have been divided and retracted, as already described, owing to the mode in which the spinous processes of the dorsal vertebræ are imbricated one over the other, it becomes necessary to remove the spine above that which, with its laminæ, is to be first taken away. This having been done the spinous process of the vertebra, the laminæ of which are to be divided, should be taken away, as close to its root as possible, with gouge forceps. With a little care the spinous process can be so completely taken off as to leave the surface sufficiently flat for the application of the crown of a trephine, which should in general be about one inch in diameter, and furnished with a strong centre pin, a little longer than usual. As the bone is of a much softer texture than that of the cranium, the trephine once planted, works rapidly, so that after a few turns the centre pin should be withdrawn, and it should then be worked gently until it is found possible to move, and subsequently elevate, the trephined portion; after this is taken out it will be seen that in the dorsal region there is a sort of provision which enables one to use the trephine without much danger of its, in any way, injuring the cord. In fact the articulating processes of the vertebra, next below, look backwards in such a way as to prevent the instrument from going suddenly in so as to injure the medulla. The posterior arch of a second vertebra may now be easily taken away, either by a second application of the trephine, or better still, by the aid, simply, of the gouge forceps.

In the cervical region the removal of the bone can be effected with great facility by the gouge forceps alone; here, as well as in operating on the first dorsal vertebra, the trephine cannot safely be employed. After the skin has been divided and the muscles detached on each side the interspinous ligaments are to be cautiously cut, taking care not to sink the scalpel too deeply; the spinous process is next taken off with the gouge forceps, and at once the ligamentum subflavum comes into view, and the vertebral canal is opened to a small extent. Bit by bit the posterior arch is then to be taken away by the gouge forceps, until enough is removed. The removal of a second or third can be even more readily accomplished with the same instrument. The retractors employed for holding back the muscles on the neck should not be so broad as those intended for the operation on the back or loins, and the lower edge of the retracting flange should be somewhat convex.

In all the cases which I have seen the wounds have gone on favourably under the simplest treatment; water dressing at first; and after suppuration has become established, charpie, with simple dressing, or a poultice with some "warm dressing" under it.

It is unnecessary to say that every possible attention must be paid to the general health of the patient. He should be placed on a water bed, the bowels and bladder carefully attended to, and any tendency to bed-sores guarded against with the utmost anxiety. For this purpose he must be shifted from side to side, and occasionally placed upon his back, even at the risk of pain in the wound or disturbance of the broken vertebra. To avoid bed-sores and keep the bladder in good order must be the first object of the surgeon, and no entreaties or complaints should influence him in deferring to do what he considers necessary for this purpose. The bed clothes must be frequently changed, and kept perfectly dry. If any bed-sores have already formed, every effort should be made to get them cured; if the urine is already alkaline and muco-purulent the bladder should be washed out every day, or several times each day.

Immediately after the operation the object of medical treatment should be to avoid inflammation of the cord or its membranes, and with this view belladonna or atropia should be administered, with the intention of keeping the medulla as much as possible in a condition of repose; opium should not be given; but if urgently demanded to allay pain it should be joined with belladonna, in doses proportionally large. Somewhat later iodide of potassium may be ordered, and when all apprehension of inflammation is past, strychnine. Indeed, it will be in different cases a very nice and at the same time very important question to determine whether it may not be good practice to give strychnine early, even at the risk of calling forth inflammatory action in the cord. Of course, its administration would not be contemplated if any tendency to myelitis can be detected. But if pressure on the medulla for a longer or shorter time has given rise to that kind of mechanical softening of it which, without being identical with white or atrophic softening, is closely akin to it, and if it seems that the parts below are not recovering their vital powers after the pressure has been got rid of, it may become necessary to make a desperate effort to rouse the dormant energies of this portion of the marrow, regarding the chance of exciting inflammation of it as the less great danger of the two. Under these circumstances I should not hesitate to give strychnine cautiously before many days after the operation.

Shampooing of the limbs and the use of electricity should be early applied, in order to arrest the atrophy of the muscles. Whatever doubt may exist as to giving strychnine at an early period after the operation there need be none about its administration after the risk of inflammation is past; it should then be added to good nourishing diet, with wine, beer, and iron tonics.

I have alluded in the foregoing pages to a case in which my colleague, Dr. Henry J. Tyrrell, lately trephined the spine, in Jervis-street Hospital. The case will, no doubt, be more fully reported hereafter. I may mention, however, that the patient, a young man twenty-one years of age, met with the injury of the spine three weeks ago; he was operated on forty-eight hours after the accident. During the operation he was thoroughly under the influence of chloroform, and since the operation the wound has gone on admirably. Whether this case may prove successful or not, it cannot be said that the patient's suffering has been materially increased, or his duration of life in any way shortened, by the operative procedure.

M. Tillaux, surgeon to the Hospice of Bicêtre, has lately reported a case of trephining of the spine, in a paper published in the *Bulletin Général de Therapeutique*, 15th March, 1866. In his communication M. Tillaux makes some very judicious observations on the symptoms which indicate or contraindicate operation in cases of fracture of the vertebral column. One is surprised, therefore, at finding that he himself selected a case eminently unsuited for it. The patient died on the night succeeding the operation, and M. Tillaux himself observes:—" Il est facile de voir par l'observation, que la mort a été le résultat d'une myélite ascendante qui existait déjà, et dont la marche a pu être seulement activée par l'extraction des fragments vertébraux.—Il ne serait pas juste de rendre l'operation responsable du résultat." In this last sentiment most surgeons will concur, and it is to be hoped that others who may look favourably on the operation will not select cases for its performance in which there cannot be the faintest hope of its being successful.

ART. II.—*On the Action of the Heart.* By GEORGE PATON, M.D., Toronto.

IF we expose the heart in a living animal, and examine its action, we will find that the auricles contract whilst the ventricles dilate, and the ventricles contract whilst the auricles dilate, and are refilled with blood from the veins. The auricles, in contracting, approximate closely to the ventricle—shoot, as it were, into the auriculo-ventricular foramen, projecting the blood into the cavity of the ventricle, and the ventricle expands, swells out, and becomes distended with blood, assuming a dark red colour. These two movements—the contraction of the auricles and the dilatation of the ventricles—appear simultaneous, being performed at the same instant of time; the ventricle then contracts, diminishing in all its dimensions, propelling the blood along the aorta and pulmonary arteries, synchronous with which the auricles dilate, and receive more blood from the venous trunks.

The auricles, in contracting, approach closely to the orifice of the ventricle, which enables them with greater facility to project the blood into its cavity. This is distinctly seen in the heart of the turtle, where the auricles in contracting shoot towards the foramen of the ventricle, leaving vacant at their upper extremity a portion of space which they occupied, but which they again immediately cover, as they stretch out and extend their parietes during dilatation. The ventricle, in dilating, enlarges in all its dimensions, its apex descends a little lower in the thorax, dipping towards the spine; its transverse diameter is increased, and anterior parietes rendered protuberant; and in some animals the margin of the base is extended upwards, so as partly to cover or conceal the auricles during their contraction. When the ventricle contracts its apex is again drawn up and slightly tilted forwards, and the body of the ventricle, much diminished in size, appears distinct from the auricles which have receded, and are again dilated, the blood flowing into them from the veins.

When the heart pulsates with vigour, and respiration is well maintained, rendering the blood duly arterialized, the contraction of the ventricle is scarcely finished before the auricles again contract and shoot a wave of blood into the ventricle, as it expands, and quickly attains its maximum of dilatation. It immediately contracts whilst the auricles dilate; and these movements occur in rapid succession, the eye being scarcely able to follow them, and analyze them distinctly; but after careful investigation and numerous experiments, we are satisfied that during this state of the system the dilatation of the ventricle is one distinct or individual act quickly performed, and that no pause or period of repose occurs during its completion. If, however, the action of the heart be slow, and the blood imperfectly arterialized the dilatation of the ventricle attains a pause before the auricles contract; and on their contraction the blood which they project into the cavity of the ventricle distends its walls, or, in other words, completes the dilatation—which phenomenon is distinctly seen in cold-blooded animals when the circulation is languid, the pulsations of the heart not exceeding 20, 25, or 28 per minute.

The circumstance of a pause occurring during the dilatation of the ventricle, in connexion with other phenomena observed in the action of the heart has led physiologists to conclude that it is only during the contraction of the ventricle that an active power is exerted, and not during its dilatation. Accordingly, it is an opinion very generally entertained by physiologists that the diastole of the ventricle is produced by the relaxation of the muscular fibres—by their returning to a state of rest, during which the blood flows from the distended auricles into the cavity of the ventricle independently of contraction; that a pause then ensues, succeeded by the contraction of the auricles projecting more blood into the ventricle, and bringing it into a state of distention; hence the dilatation of the ventricle is supposed to consist of two stages: during the first stage the blood flows from the auricles into the cavity of the ventricle to supply the vacuum that is formed by the receding walls of the ventricle as it assumes a state of rest; during the second stage, the blood is propelled by the contraction of the auricles into the ventricle already partially filled to complete the dilatation. But during both these stages the ventricle is supposed to exist in a passive or relaxed condition.

This view has been very distinctly expressed by Dr. Hope in his *Analysis of the Movements of the Heart.* He divides, as did Lænnec, a beat of the heart into several parts—that is, from the commencement of one pulsation to the corresponding period in the next:—"1st. The ventricular systole occupies half the time, or thereabouts, of a whole beat. 2nd. The ventricular diastole occupies a fourth, or at most a third. 3rd. The interval of ventricular repose occupies a fourth, or rather less, during the latter half of which the auricular systole takes place." This makes a whole beat consist of four parts. The ventricular systole occupies two-fourths of a beat, the ventricular diastole one-fourth, and the period of repose one-fourth, during the latter half of which the auricle contracts, projecting the blood into the ventricle, thus allowing one-eighth of a beat for the period in which it is performed.[a]

The data on which these conclusions rest appear to have been limited to the action of the heart when it is slow, and the blood imperfectly arterialized; at least this is the description of the action of the heart of an animal in that condition. This phenomenon is distinctly seen in cold-blooded animals during the period of Winter, or when they are reduced to a state of partial asphyxia, the action of the heart being much depressed, amounting to ten or twelve pulsations per minute. In the frog, to which Dr. Hope's observations refer, the ventricle, on contracting, immediately dilates, its apex being extended a little lower, and its parietes expanding, so that blood flows into the cavity from the auricles, partially distending it. A pause then ensues, during which the ventricle and auricles remain quiescent; the auricles then contract, propelling more blood into the ventricle, which causes the anterior parietes to bulge out or protrude slightly in the centre—on which the ventricle immediately contracts, becomes small and pale, propelling the blood along the aorta or bulbus arteriosus, as it is termed; and these movements continue in regular succession. But if the animal respire at times the action of the heart is accelerated, amounting to fifteen or twenty pulsations in the minute, the pause becomes shorter, and the movements are performed with greater vigour.

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[a] Dr. Hope on Diseases of the Heart, p. 20.

If we were permitted to reason *a priori*, we might conclude that the action of the heart, which is suited to a condition of the system in which all the functions are depressed, would not be adapted to the circulation of an animal whose heart beats at 60, 80, or 90 pulsations per minute—the blood moving with great velocity, and passing through the heart once every three or four minutes, or twenty times in the hour. But science requires data founded on strict observation, and a rigid induction of facts; and many physiologists, in order to determine this question, have observed the action of the heart in living animals whose respiration was fully maintained, and the circulation vigorous, and have failed to perceive the pause or the two stages of dilatation. Majendie, who frequently denuded the heart of living animals, observes that the action of the auricles and ventricles alternate, but makes no mention of a pause. And Professor Cruveilhier, who had an opportunity of investigating this subject in the case of a child whose heart was protruded without the walls of the chest—the auricles and ventricles dilating and contracting with vigour, and respiration being fully established, states:—1st. That the contraction of the auricles was synchronous with the dilatation of the ventricles. 2nd. That no pause or period of repose occurred during the dilatation of the ventricle. 3rd. That the auricles and ventricles dilated with a force, which afforded every indication of being an active vital movement.

And our researches on the action of the heart in living animals lead us to conclude:—1st. That when the action of the heart is slow, and the blood imperfectly arterialized, a pause occurs during the dilatation of the ventricle. 2nd. When the action of the heart is vigorous the pause disappears, and the dilatation of the ventricle takes place simultaneously with the contraction of the auricles. 3rd. That the diastole affords evidence of being an active power as well as the systole.

When the blood is highly arterialized, and the action of the heart vigorous, the dilatation of the ventrical consists of an individual, or continuous act quickly performed in unison with the contraction of the auricles. If we examine the action of the heart under these circumstances, as the heart of a frog, we will perceive that the contraction of the auricles is synchronous with the dilatation of the ventricle, which annihilates the pause; and that the ventricle as it dilates not only extends its apex a little lower, but rapidly stretches its parietes upwards, so as almost to conceal the auricles, as they contract, and project the blood into its cavity—a movement opposed to that of relaxation, and evidently dependent on some inherent power possessed by the ventricle itself. And if we observe the dilatation of the auricles, as it appears in the heart of the turtle, we will find that it consists in a rapid extension of the parietes in a longitudinal form till they have attained or reached their extreme limit, thus enlarging the capacity of the auricles as the blood flows into them from the veins.

And the increased rapidity with which the ventricle dilates, as the circulation of the blood is accelerated, could not be explained on the principle of relaxation, but decidedly indicates a vital active movement.

If the heart pulsates at the rate of thirty beats per minute, or one beat in two seconds, the contraction of the ventricle, according to Dr. Hope and others, occupies one half of this period or one second; and the first stage of the dilatation, which is described as taking place instantaneously, occurs in one-fourth of the beat, or half a second—considered to be dependent on the relaxation of the fibres of the ventricle, bringing it into a state of rest; the remaining one-fourth of the beat, or the half second, being occupied by the pause or period of repose, and the contraction of the auricles, increasing the amount of blood contained in the cavity of the ventricle, and bringing it to a state of distention. If the heart pulsates at the rate of sixty beats per minute, or one beat per second, the contraction of the ventricle occupies one half of this period, or takes place in half a second, and with twice as great velocity as when the ventricle contracts at thirty beats per minute; and the first stage of the dilatation which occupies one-fourth of a beat is also accomplished in one-half the time, or with double the velocity that it is when the heart beats at thirty pulsations per minute, the remaining one-fourth of the beat being occupied by the period of repose, and the auricles contracting at double the velocity, bringing the ventricle to a state of distention; and if the heart pulsates at the rate of ninety beats per minute, or three beats in two seconds, the ventricle contracts at the rate of three times the velocity that it does when the heart pulsates at thirty beats per minute; and the ventricle also dilates with three times greater rapidity, showing that the dilatation of the ventricle is regulated by exactly the same influence and under the same law as its contraction, and that its diastole is as much an active power as its systole.

If the dilatation of the ventricle takes place with various degrees of rapidity, according to the force and velocity with which the ventricle contracts, and in order that the circulation may be carried on at a certain rate of speed, then, it must be the result of a vital power as well as the contraction, and not the mere passive relaxation of the muscle. Again, if the dilatation of the ventricle be accomplished in one-third of the time, the heart beating at ninety per minute, that it is when the heart pulsates at thirty per minute; it follows that the blood must pass from the auricle into the ventricle and distend it in this minimum period. But if there be two stages of the dilatation, the auricle contracting during the latter half of the second stage, it leaves at this rate of speed the auricle only one-twelfth of a second to contract and complete the dilatation of the ventricle, a rapidity at variance with all that we have seen of the contraction of the auricle and dilatation of the ventricle during a similar state of the circulation. For when the blood moves with great velocity, the contraction of the auricle commences simultaneously with the dilatation of the ventricle, and the ventricle without any intermission speedily attains its maximum of dilatation.

Whilst the circulation is maintained at this degree of rapidity, the dilatation of the ventricle in order of rhythm and of time precedes its contraction. For the contraction of the auricles, as is well known, takes place before that of the ventricles; and as the dilatation of the ventricles is synchronous with the contraction of the auricles, it is evident that it must be considered to precede and not to follow the systole of the ventricle. When the heart pulsates at the rate of sixty beats a minute, a speed similar to what obtains in many warm-blooded animals in a state of health, the contraction of the ventricle is scarcely finished before the auricles contract, and the moment the jet of blood enters the cavity of the ventricle it expands, and the diastole is quickly completed and succeeded by the systole. And here nothing like a suction power is exerted by the ventricle, the blood being distinctly projected by the auricle as it contracts. Nor does any pause or period of repose intervene from the commencement of the dilatation till its completion.

But when a pause occurs during the diastole of the ventricle, that is to say, when the action of the heart is comparatively slow, the diastole of the ventricle is considered to follow the systole, and not to precede it,[a] because the first stage of the dilatation and the pause is completed before the auricles contract, and shoot down to the foramen of the ventricle to complete the second stage of the diastole, on which the ventricle immediately contracts.

Haller, who seems to have viewed the action of the heart when it was slow, and who strongly maintained the doctrine of the relaxation of the ventricles, enquires the reason of the particular order or occurrence of the movements—that is, why the auricles contract, whilst the ventricles dilate, and dilate whilst the ventricles contract; and then the ventricles repose dilated, and the auricles smartly contract? And Dr. Hope, considers the reason to be that the auricles, which have been refilling during the contraction of the ventricles, are brought to a state of distention, by which they contract at the moment of repose, in order that the ventricles by the additional quantity of blood which they receive from the auricles, may then be distended and stimulated to contract. But according to the views which we have advanced, these movements arise as a necessary consequence from, or are intimately connected with the action of the heart when it is slow; and the movements are performed in a different manner when the action is accelerated; the reason of which movements will become more obvious as we proceed.

This subject, however, will be better understood if we describe a few of the experiments we have performed in our researches on the action of the heart.

If we expose the heart of a living fish, whose gills are well protected by the operculum, enabling them to retain a due degree of moisture, sufficient to sustain the function of respiration for a considerable time, after the animal has been removed from the water—and it is surprising to what extent this power is possessed by some fishes—it will be found that when the effect of the operation has subsided, the circulation will be carried on with energy, and the animal will survive for a time, affording ample opportunity to study the movements of the heart.

July 8.—Denuded the heart of a living fish[b], and carefully observed the action of the heart.

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[a] Dr. Hope on the Heart, p 19.

Commonly termed the *Mud Cat Fish.*

The heart beat at thirty-six pulsations per minute, and the auricle, on contracting, projected the blood into the cavity of the ventricle, which slightly bulged out in the centre, and contracted, the apex being tilted up, and the blood propelled along the bulbus aortæ, the ventricle immediately dilated and a slight pause ensued, during which both auricle and ventricle were quiescent. The auricle then contracted and projected the blood into the ventricle, and the same movements were repeated. After dilatation the ventricle did not move till the auricle contracted, but the auricle which remained dilated, having been refilled with blood from the veins during contraction of the ventricle, contracted shortly after the pause ensued. During contraction the ventricle was drawn up or contracted towards the bulbus aortae; but during dilatation the fibres were stretched out or elongated towards the abdomen; and the contraction seemed to occupy longer time than the dilatation.

The pulsations increased to forty-two per minute, and then the auricle commenced to contract just as the ventricle reached the pause—that is, simultaneously with the completion of the dilatation of the ventricle.

But on the pulsations amounting to fifty per minute, the contraction of the auricle commenced before the dilatation of the ventricle was completed, or before it came to a pause. The moment the auricle contracted and propelled the blood into the ventricle, the dilatation was completed, and the ventricle contracted; and the reason apparently was, that the ventricle was stimulated or excited by the action of the auricle as it projected the blood into its cavity; and in this case there was no pause or period of repose, the act of dilatation being distinctly continuous.

During these movements of the heart the function of respiration was maintained, as the blood passed along the bulbus aortæ with great rapidity to the gills, which were at times moistened with water sprinkled over them; and we observed that when the animal respired, opening and shutting the operculum with vigour, the action of the heart was quickened.

July 4th.—The heart was exposed in another living fish, and the phenomena beautifully seen, as the animal survived long, and the heart continued to act with great vigour, pulsating at sixty and sixty-four per minute.

When the auricle contracted or projected blood into the ventricle, it expanded and bulged slightly out in the anterior parietes, extending its apex rapidly outwards, and then contracted towards the bulbus aortae, the apex being distinctly tilted up. The contraction was no sooner terminated, and the dilatation commencing, than the auricle again contracted and sent a wave of blood into the ventricle; and the same movements were repeated, and continued without interruption, the ventricle dilating and contracting in quick and regular succession; the contraction of the auricle was now synchronous with the dilatation of the ventricle, and the pause or period of repose entirely disappeared.

On one occasion, when the animal had struggled much, and turned upon its side, the ventricle became empty and quiescent, and we observed, on the animal being re-adjusted, that the moment the auricle contracted and projected blood into the ventricle, it dilated and then contracted; the same effect we have frequently seen produced in other instances, from which we inferred that the blood projected by the auricle exerts an influence on the dilatation of the ventricle.

In other fishes, on rapidly denuding the heart, we have found the auricle, ventricle, and bulbus aortæ acting with great energy, at the rate of eighty pulsations per minute; the auricle contracting towards the orifice of the ventricle, and the ventricle contracting towards the bulbus aortæ, on which occasion there was no pause nor anything approaching it, in the dilatation of the ventricle; and no evidence that any blood flowed from the auricle into the ventricle, by a suction power, to fill up a vacuum. But the blood which entered it was distinctly projected from the auricle during its contraction, which was synchronous with the dilatation of the ventricle; hence there was not two stages of the dilatation, but one, and that one rapidly performed.

June 16th.—Denuded the heart of a living turtle,[a] and observed its action. Respiration was not affected, the animal continuing to respire at times, as is usual with cold-blood animals.

After the operation the heart beat at sixteen pulsations per minute.

In the Turtle, the auricles, on contracting, shoot down in a lateral direction to the foramen of the ventricle, leaving vacant a space at the extremity of each to the extent of one-fourth of an inch, which they again cover as they fall back, and stretch out their parietes during dilatation. After contraction the auricles immediately dilate, and during dilatation the blood flows into them from the venous trunks; then they remain distended and quiescent for an instant, till the next contraction.

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[a] Mud turtle.

When the ventricle contracts its base is raised up towards the bulbus aortæ, along which it propels the blood; and this vessel becomes more curved, hard, and tense at the moment; after contraction the ventricle immediately dilates, and a pause ensues, during which the auricles and ventricle are quiescent. Then the auricles contract and propel more blood into the ventricle, completing the dilatation, or as it has been termed, producing distention of the ventricle, on which it instantly contracts, and again dilates, attaining a pause as before; and these movements continue.

When the heart beat at 22 pulsations per minute, its action was more vigorous then when it beat at 16 per minute,and the pause of shorter duration ; in other words, the auricles contracted sooner, propelling the blood into the ventricle—completing the second stage of dilatation.

The action of the heart having increased to 28 pulsations per minute the auricles contracted as the dilatation of the ventricle attained the pause.

But on the pulsations increasing to 32 per minute the auricles contracted, projecting the blood into the cavity of the ventricle as it dilated or proceeded to a pause. The dilatation was completed, and the ventricle contracted, but no pause occurred—the dilatation consisting of one individual act.

When the action of the heart attained to 36 or 38 pulsations per minute, the contraction of the auricle was synchronous with the dilatation of the ventricle—that is to say, the auricles commenced to contract, and shoot down to the foramen of the ventricle as the ventricle began to dilate. It almost appeared as if the blood which the auricles projected into the cavity caused its dilatation—the ventricle expanding and dilating as the wave of blood entered it. The auricles dilated and received more blood from the veins, whilst the ventricle contracted, and the instant the auricles were refilled with blood they contracted, whilst the ventricle dilated; these movements being performed in rapid and uniform succession. But the contraction of the ventricle seemed to occupy longer time than its dilatation. Then there was no pause, the dilatation of the ventricle consisting of one act—synchronous with the contraction of the auricles.

Neither the auricles nor ventricle appeared to empty themselves during the contraction, expelling only a portion of the blood which they contained.

July 21.—The heart of another living turtle was denuded, and the phenomena observed. Respiration continued; and after the effects of the operation had subsided, we examined the action of the heart, and found it 25 pulsations per minute.

The dilatation took place immediately after the contraction of the ventricle, and proceeded to a pause. The auricles then contracted, projecting more blood into the ventricles, completing the dilatation—on which the ventricle contracted.

But when the pulsations attained to 36 per minute, the auricles contracted simultaneously with the dilatation of the ventricle; that is, after the contraction was finished, and the dilatation of the ventricle commencing, the auricles contracted, projecting a wave of blood into the ventricle, and the dilatation was completed. They immediately receded, extending or stretching their parietes outwards, and dilated, receiving more blood from the veins, whilst the ventricle contracted, propelling the blood along the bulbus aortæ. And these movements were continued, the contraction of the auricles coinciding with the dilatation of the ventricle—the pause disappearing—and the dilatation consisting of one act quickly performed; 36 pulsations per minute were the highest attained.

During all these experiments respiration was continued, the animals respiring at times, as is done by cold-blooded animals, and then the action of the heart was accelerated.

When the animal became agitated and struggled much, we have seen the ventricle contract and dilate for several successive times, whilst the auricles remained motionless and distended with blood; but on the auricles contracting, the regular and uniform action of the heart was restored.

As regards the dilatation of the auricles, we cannot suppose that it was produced by the mere influx of blood into the cavity, for it was during the extension of the parietes that the blood flowed from the veins, and the veins have not the power, by the blood which they pour into the auricles, to produce such a movement. It was not like distention, but an actual expanding or stretching out of the parietes of the auricles, as if by an innate power which they possessed.

July 15.—Denuded the heart of a frog which had been reduced to a state of partial asphyxia—carefully guarding against injuring the muscles of the throat, on which the function of respiration depends.

After the effects of the operation had subsided, we examined the action of the heart, and found it 30 pulsations per minute.

The ventricle having contracted, and propelled the blood along the bulbus aortæ, immediately dilated, becoming partially filled with blood, the apex being stretched out or extended lower, a pause ensued, during which the auricles contracted, projecting more blood into the ventricle, which expanded its parietes, and extended its base upwards—thus completing the second stage of dilatation and contraction, and contraction immediately ensued. Sometimes the first stage of dilatation was so closely succeeded by the contraction of the auricles, and increase of blood into the ventricle, that it seemed almost one continuous act. The first dilatation was very short, and quickly performed, and the principal act of dilatation was when the auricles contracted, and projected the blood into the ventricle. It was not distention, but an actual stretching out and expanding of the parietes of the ventricle, so as greatly to enlarge its capacity, and it instantly contracted.

The action of the heart increased to 36 pulsations per minute, and the dilatation of the ventricle was now continuous—no pause—the auricles contracting, and projecting the blood into the ventricle as it dilated and extended its parietes—assuming a dark red colour. It immediately contracted, and these two movements were continued—the ventricle dilating as it received the blood from the auricles, and contracting as it propelled the blood along the bulbus aortæ. In dilatation, the apex of the ventricle descended a little lower, dipping towards the spine, the anterior parietes became protuberant, and the margin of the base was rapidly extended, partially concealing the contracting auricles from the view. In contraction the ventricle became small and pale, being apparently emptied of its blood, and the apex was slightly tilted up. Whilst the heart acted with this degree of vigour, the animal respiring freely and remaining at rest, the pause or period of repose disappeared in the dilatation of the ventricle—the dilatation consisting of one distinct act, because the auricles contracted sooner in the order of time and of rhythm, and as the ventricle dilated.

The animal became restless and agitated, and the ventricle lay contracted and motionless; but on the animal becoming quiescent, the auricles contracted or shot down to the orifice of the ventricle and that moment the ventricle expanded or opened up its parietes, the blood being projected into its cavity. It contracted as the auricles receded or dilated, and the movements were continued in regular succession, and were always more vigorous when respiration was renewed and continued for a time.

The animal having remained at rest for a considerable time, respiration being maintained with vigour, the action of the heart increased to 44 pulsations per minute.

The instant the auricles dilated, and were refilled with blood from the veins, they contracted or shot down to the foramen of the ventricle, and the ventricle rapidly dilated, opened up, and extended its walls as the blood entered it. It immediately contracted, propelling the blood along the bulbus aortæ; and the same movements were repeated and continued. The dilatation of the ventricle was now synchronous with the contraction of the auricles, and it seemed as if the blood projected by the auricles excited the ventricle to dilate; the instant it touched the ventricle, the ventricle opened up, and expanded its parietes, and was filled with blood. There were thus two distinct forces in operation—the auricles contracting and projecting the blood into the ventricle, and the ventricle expanding its parietes and enlarging its capacity to receive it.

September 12th.—Denuded the heart of a living frog, leaving the muscles of the throat uninjured. Respiration was continued and maintained with vigour.

The heart beat at 60 pulsations per minute; and as the auricles shot down to the foramen of the ventricle, or contracted, projecting the blood into its cavity, the ventricle dilated, its fibres being distinctly stretched out or elongated as usual, it immediately contracted, diminishing in all its dimensions, whilst the auricles dilated. And these movements went on in regular succession, the ventricle dilating as the blood was projected into it during contraction of the auricles, and immediately contracting and propelling the blood along the bulbus aortæ. But after contraction of the ventricle it did not dilate before the auricles contracted; in other words, the contraction of the ventricle was just terminated when the auricles shot down to the foramen of the ventricle, or contracted; and that moment the ventricle dilated, expanding its parietes and extending its apex as the blood flowed into it, and then contracted with great energy, the blood being expelled. The action of the ventricle consisted of dilatation and contraction, maintained without interruption, the dilatation of the ventricle being synchronous with the contraction of the auricles, and its contraction coinciding with their dilatation, the dilatation of the ventricle being one distinct act, without any intervening pause.

October 5th.—Denuded the heart of a living frog, and found the pulsations 80 per minute. Respiration was maintained with energy.

The ventricle dilated whilst the auricles contracted and projected the blood into its cavity; and it contracted whilst the auricles dilated, diminishing in all its dimensions, and propelling the blood along the bulbus aortæ. There was no pause or interval of repose between the dilatation of the ventricle and contraction of the auricles. This fact was clearly and distinctly ascertained, on some occasions the ventricle having contracted, and being small and pale, the auricles shot down to the foramen of the ventricle, or contracted; and that instant the ventricle expands or dilates, assuming a florid red colour. But no dilatation of the ventricle took place, and no blood entered its cavity except during contraction of the auricles—whilst they contracted the ventricle dilated, and *vice versa*—the movements being repeated and continued in quick and alternate succession.

On carefully observing the action of the ventricle, it appeared when the ventricle dilated, as if its fibres were stretched out or extended to a certain extent; and then drawn up and retracted during contraction. The dilatation appeared the first or principle act, and the contraction succeeded it.

There was a unison in all these movements. When the action of the heart was increased or diminished a little, the contraction of the auricles which took place immediately on being dilated, was so regulated that it occurred just as the contraction of the ventricle was finished, rendering the dilatation of the ventricle synchronous with the contraction of the auricles; and they were dilated and refilled with blood during the contraction of the ventricle.

The movements of the ventricle then consisted of dilatation and contraction, the former being one distinct and individual act, without an intervening pause. The ventricle dilating and then contracting as a consequence of its dilatation.

During contraction, the ventricle appeared to expel all the blood which it contained, as it became small and pale. But during contraction the auricles expelled only a portion of their contents, as they never appeared to be completely empty.

We may also state, when the heart was quickly denuded in these animals, its action was often observed to be maintained with great vigour. In the fish and the frog the bulbus aortæ contracted immediately after and in unison with the contraction of the ventricle. And in the turtle immediately after contraction of the ventricle, as the wave of blood was passing along the aorta or bulbus aortæ, that vessel became more curved, hard, and tense; all of which movements were evidently designed to impart an impulse to the blood in its onward course, as it proceeded to the organs of respiration, or to be distributed throughout the body.

These experiments will enable us to judge respecting the manner in which the dilatation of the ventricle is accomplished, and the action of the heart increased. It appears that when the action of the heart is weak and languid the ventricle dilates without much apparent vigour, and attains a pause, before the contraction of the auricles commences, and completes the dilatation. This is distinctly seen in cold-blooded animals, when the heart pulsates at 20 to 25 per minute. 2nd.—When the heart acts with greater energy, the contraction of the auricles coincides with the pause, or shortly precedes it. And third, when the heart beats with great rapidity, the auricles contract simultaneously with the dilatation of the ventricle; so that no pause, nor anything approaching it, is manifested, but the dilatation is completed by a quick and continuous movement, and accomplished in a much shorter time, than when a pause intervenes, before the auricles contract, and project their blood into the cavity of the ventricle.

What is the cause of this increased action of the heart, the animal remaining in a calm and quiescent state, without manifesting symptoms of agitation or uneasiness? It seems to be intimately connected with the condition of the blood. While the blood continues dark and imperfectly arterialized, the action of the heart is weak and depressed, and a pause occurs during the dilatation of the ventricle, before the auricles contract and project their blood into its cavity. But as soon as respiration commences or is increased, the action of the heart improves, and a pause can scarcely be discovered in the dilatation of the ventricle, the auricles contracting before the commencement of the pause, or coinciding with it. And when respiration is fully established and maintained, the heart pulsates with great vigour and no pause occurs, the contraction of the auricles being synchronous with the dilatation of the ventricle.

On the other hand, if a high rate of speed abates, and the action of the heart becomes less vigorous, the auricles are later in contracting and in projecting their blood into the dilating ventricle, till at length a pause intervenes before the auricles contract.

We perceive then how the action of the heart is adapted to the different rates of speed in the circulation of the blood, according to the condition of the animal, and the circumstances in which it is placed, and how the circulation is increased in unison with the demands of the system. The auricles contract sooner in the order of time, overtake as it were the ventricle in dilating, or actually commence with it, whilst the ventricle at the same instant manifests vital energy and activity in the increased rapidity with which it dilates, and receives the blood into its cavity.

Let us now enquire how the doctrines we have enunciated apply to the action of the heart in warm-blooded animals, and the phenomena there observed; premising, that the movements of the heart are acknowledged to depend on the same principle in all vertebrated animals; physiologists being agreed that the heart of the frog pulsates in the same manner, and observes the same laws, as the heart of the rabbit, ass, horse, and other warm blooded-animals. Indeed, during the heat of Summer, when the cold-blooded animals assume the physiological condition of the warm-blooded, the action of the heart appears to be identical, not only as regards the principle on which the movements depend, but the quickness and rapidity with which they are executed and maintained—the pulsations in many of them amounting to 70 or 80 per minute.

Dr. Hope informs us, in his experiments on the ass, whilst investigating the sounds of the heart, he found that, when its action fell to the natural standard, from 40 to 50 beats a minute, the pause occurred during the dilatation of the ventricle. "Three motions," he states, "could be distinctly recognized, namely, the auricular systole, the ventricular systole, and the ventricular diastole."[a] Now, we know that during the auricular systole the blood is projected from the auricles into the ventricles; and during the ventricular systole the blood is propelled from the ventricles along the aorta and pulmonary artery; and the ventricular diastole is the dilatation of the ventricle terminating in the pause.

He also states, in another part of his work, that "when the animal which was the subject of experiment, regained the slightest degree of sensibility, the action of the heart was so violent, convulsive, and rapid, as to present the appearance of alternate action described by Majendie;" or, in other words, that a pause could not be satisfactorily recognized during the dilatation of the ventricles. And "that in small animals also, as rabbits, whose pulse beats 150 to 200 a minute, the same appearance is generally presented, even though they have been completely killed, for the interval of repose is too brief to be appreciated by the eye." "Nay, in asses poisoned by woorara, much the same appearance is presented, whenever the pulse is accelerated 20 or 30 beats above its natural standard of 40 or 50, the contraction of the auricle, then becoming more active and extensive, and encroaching so much on the interval of repose as to render it indistinct to an unpractised eye. I am therefore inclined to think that during palpitation or unnaturally accelerated action, the period of repose actually is encroached on."

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[a] Dr. Hope on Diseases of the Heart, p. 16, 17.

From these statements it appears that Dr. Hope was unable to perceive the pause or period of repose in the action of the heart in warm-blooded animals, when it was rapid and amounted to 50 beats and upwards a minute; and the reason is, that according to a general law in the action of the heart, when the circulation is maintained with vigour the pause does not exist, but disappears. It can be satisfactorily shown that in this condition of the system not only is the pause or period of repose encroached on, but the contraction of the auricles, as we have seen, anticipates that period, and takes place simultaneously with the ventricular diastole. A fact which has been distinctly recognized by many physiologists in their experiments on the action of the heart in warm-blooded animals.

To illustrate this subject let us consider the action of the heart in some warm-blooded animals when it is slow and the pause visible, and then where it is accelerated—remembering that the movements of the auricles are simultaneous, as well as the movements of the ventricles; and that the description of one comprises that of the other.

The ventricles contract and propel the blood along the aorta and pulmonary artery, and the ventricular diastole immediately takes place, during which there is an influx of blood from the auricles to the ventricle partially filling it; a pause ensues, and the auricles contract, propelling more blood into their respective ventricle, which expands its walls as the blood enters it, becoming fully dilated; and instantly contracts, propelling the blood along the aorta and pulmonary artery; the ventricular diastole again takes place, and the movements are continued. But on the action of the heart becoming accelerated, instead of a portion of blood passing from the auricles to the ventricle, partially dilating it, it is all projected by the contraction of the auricle, completing the diastole at once, instead of two successive stages; and the same movements are repeated and continued without intermission. What is the consequence? The auricles contract immediately after the contraction of the ventricles is finished, and not as formerly, after the completion of the first stage of the dilatation, which circumstance annihilates the pause; and as the dilatation of the ventricle is now completed at once, and synchronous with the contraction of the auricles, it may be considered in order of rhythm and of time to precede the next ventricular systole, so that the movements of the ventricle are converted into the diastole and the systole; during the former, the blood is projected by the auricle into the cavity of the ventricle; and during the latter, the blood is propelled by the ventricles along the aorta and pulmonary artery.

Dr. Hope, and the physiologists who adopt his views, consider the dilatation of the ventricle during the first stage, as it proceeds to a pause, to occur after the systole; and the second stage of the dilatation, which is connected with the contraction of the auricles, to precede the systole. The first stage of the dilatation he views in relation to the preceding systole, and the second stage in relation to the succeeding systole. But if during the vigorous action of the heart in warm-blooded animals the contraction of the auricles coincides with the diastole of the ventricle, and this be completed at once, and not at two successive stages—we are entitled, on the same principle as that adopted by Dr. Hope to consider the diastole to precede the systole—that is, to view it in relation with the succeeding systole; and this is, undoubtedly, what took place in the case of the child, where the heart was protruded without the walls of the chest, and the action was so carefully observed by Cruveilhier. The contraction of the ventricles is stated to have been precisely synchronous with the dilatation of the auricles; and the dilatation of the ventricles to have been performed at the same time with the contraction of the auricles; no period of repose intervening between the two sets of actions;[a] and Majendie states:—"If the heart of a living animal is denuded, we easily see that the auricles and ventricles contract and dilate alternately. These movements are so arranged that the contraction of the auricles takes place simultaneously with the dilatation of the ventricles, and *vice versâ;* that the contraction of the ventricles coincides with the dilatation of the auricles." And our views are to the same effect.

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[a] Carpenter's Physiology.

We have denuded the heart of living warm-blooded animals, and carefully observed its action. We have found the pulsation in some cases 90, in others 120, &c., per minute; but we could only recognize two movements in the ventricle, namely, its dilatation and contraction. The dilatation took place simultaneously with the contraction of the auricles, and the systole coincided with their dilatation. There was nothing like an intervening pause, or anything approaching it, in the dilatation of the ventricle.

These facts, established by careful observation, undoubtedly prove that when the dilatation of the ventricle is synchronous with the contraction of the auricles, being completed in one act, it must be considered to precede the ventricular systole, and not to succeed it.

This view may appear at variance with the fact that the second sound of the heart which immediately follows the first is usually considered as coinciding with the ventricular diastole, when the auricles are considered to contract a little later, and to be quickly succeeded by the contraction of the ventricles. In explanation of which we must remember that when the ventricles contract and propel the wave of blood along the aorta and pulmonary artery, the contractile or elastic power which these vessels exert in assisting the circulation forces a portion of the blood against the semilunar valves and produces the second sound the moment the ventricular systole ceases or the *vis a tergo* is withheld. In the fish and frog the bulbus aortæ contracts immediately after the contraction of the ventricle, and assists in propelling the blood forwards. And in the higher order of animals the contractile or elastic power possessed by the aorta or pulmonary artery produces the same effect; so that we perceive how the second sound quickly succeeds the first. And if we adopt the more recent view,[a] that the first sound of the heart is produced chiefly when the blood from the ventricle enters the aorta and pulmonary artery, we are enabled to explain not only how the second sound quickly follows the first, but how the greater interval elapses between the occurrence of the second and that of the first sound—the period of silence in the healthy action of the heart.

With the second sound of the heart commences the dilatation of the ventricles, and simultaneously with this the auricles contract; and as the blood is projected into the ventricle it expands, swells out, and becomes freely dilated. Here the act is more prolonged than during the first stage of dilatation, because the whole of the blood that enters the ventricles is projected by the auricles. And the interval is greater between the commencement of the contraction of the auricles and the contraction of the ventricles; in other words, the full dilatation of the ventricles is completed—in unison with the contraction of the auricles—and then the ventricle contracts.

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[a] Carpenter's Physiology, page 417.

But how do these views harmonize with the description that has been recently given of the direct mitral murmur, that is the murmur produced by contraction of the mitral valve, and manifested when the blood flows from the auricle into the ventricle? It is well known that this murmur has generally been associated with the second sound of the heart;[a] because it was believed that then the ventricle rapidly dilated and admitted an influx of blood from the distended auricles. But it was considered that though the contraction of the valve might exist to a considerable extent, the murmur was of rare occurrence, owing to the weakness of the current of blood flowing from the auricle into the ventricle, preceding the pause or rest of the heart. And it was also maintained, that when the auricles contracted the force which they exerted was small, and the ventricle being already full the resistance required to be overcome before an extra quantity of blood could enter the ventricle necessarily retarded the force and velocity of the current, and consequently weakened or suppressed the murmur.

But Dr. Gairdner, as the result of his pathological researches, is decidedly of opinion that the direct mitral murmur is of frequent occurrence, and precedes the first sound of the heart, rather than succeeds the second sound, and that its real place in the rhythm of the heart is misrepresented when it has been viewed as a diastolic murmur, and not as produced whilst the auricles contract and transmit the blood into the ventricles. Hence he has termed it an auricular-systolic murmur. But as Dr. Gairdner at the same time admits that the diastole and the pause precede the contraction of the auricles, and as, according to that physiological view of the action of the heart, one-eighth of a beat is allowed for the auricles to contract and pour the blood into the ventricles—which at the rate of 60 pulsations per minute is one-eighth of a second, and at 90 pulsations per minute is one-twelfth of a second—it is difficult to perceive how this corresponds with the character of the murmur, as prolonged, and extending through the pause, and at times appearing to arise from the second sound. Dr. Gairdner describes the murmur in Case I. "as a pure auricular-systolic murmur, extending, however, through the pause, and, therefore, at times appearing almost to spring from the second sound, increasing afterwards in intensity, so as to abut sharply and with emphasis upon the first sound." And in the second case he says, "the other murmur is clearly endocardial—that is, the auricular-systolic murmur, being long and rough, extending quite through the pause, and almost beginning at the second sound."[a]

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[a] Dr. Hope on Diseases of the Heart, p. 78 and 388.

We quite agree with Dr. Gairdner in considering the direct mitral murmur an auricular systolic murmur, but we submit that the description which he gives of it, and which is no doubt perfectly correct, goes far to support the view, that the diastole of the ventricle is synchronous with the contraction of the auricles.

In reference to the argument that when the diastole of the ventricles is synchronous with the contraction of the auricles, it must be considered to precede the systole, since it is admitted that the auricles contract before the ventricles, we may further state: it appears to be the normal action of the heart, that the auricles dilate whilst they receive the blood from the veins, and then contract in expelling it into the ventricles; and if the dilatation of the ventricles be simultaneous with the contraction of the auricles, it follows that this act is not relaxation of the muscular fibres, but must be viewed as a distinct and definite power possessed by the ventricle, by which it opens up and expands its parietes, as the blood flows into its cavity; and then it contracts and projects the blood along the arteries, so that we have an active power exerted both in the dilatation of the ventricle and in its contraction, which alone, in our opinion, is consonant to the high rate of speed maintained in the movements of the heart, the pulsations amounting to 80, 90, or 100 per minute, and even 200 per minute, as in the menoculus pulex; and the character of the movement equally indicates an active power, the dilatation being distinctly continuous, of a unique character throughout, from its commencement to its completion. And the same fact is also clearly manifested by the force and vigour with which the ventricle dilates in the higher order of animals. Hence we conclude that the diastole is produced by an actively dilating power inherent in the ventricle.[b]

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[a] Medical Times and Gazette, Oct. 29th, 1864.

[b] Dr. Williams remarks, "That the ventricles have an actively dilating power, was held by Bichat, Pechlin, Carson, and others; and even by Lænnec; and although

Professor Cruveilhier states that the diastole of the heart of the child was performed with the power and energy of an active movement, being sufficient to force open the hand that was closed upon it.

From these researches and statements, we think, we are warranted to conclude that when the action of the heart is vigorous, and respiration fully mantained:—1st. The dilatation of the ventricles is synchronous with the contraction of the auricles. 2nd. That no pause or interval of repose occurs during the dilatation of the ventricle. 3rd. The diastole of the ventricles precedes the systole. 4th. The diastole is performed with a power and vigour that affords every indication of a vital active movement.

With regard to the manner in which dilatation of the ventricle is accomplished when no pause occurs—the ventricle must either be possessed of a power within itself by which it attains its maximum of dilatation in unison with the contraction of the auricles, but independent of its influence. For if it precede the contraction of the ventricle, as it undoubtedly does, it cannot be considered the relaxation of the muscle, and its returning to a state of rest. Or the contraction of the auricle by the blood which it projects into the cavity of the ventricle must also stimulate the parietes to extend their fibres and complete the dilatation. But whatever view we entertain, it is evident, that in either case, an active vital power is exerted by the ventricle during the act of dilatation.

During this state of the circulation, the contraction of the auricles takes place, just as the contraction of the ventricle is concluded; and the moment the blood from the auricles touches the ventricle, it expands, swells out, and quickly attains its maximum of dilatation, which would lead us to believe that the blood propelled by the auricle exerts an influence on the rapidity of the diastole of the ventricle. And we have frequently seen, both in the frog and the fish, when, from the agitations and struggles of the animal, the ventricle had become empty and quiescent, that the instant the auricle contracted and projected blood into the ventricle its parietes expanded—dilatation was produced We have also observed when the auricles have contracted during what is termed the second stage

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opposed to what we at present know of animal dynamics, it would be rash to absolutely deny the possibility of its existence . . . whatever be the cause the diastole in large animals is sufficient to force open the hand of a person grasping the ventricles, and it is therefore not surprising that this should have been ascribed to an actively dilating power."—Williams on the Heart, p. 298.

of dilatation, that the blood as it entered the ventricle produced not merely distention but actual dilatation of its walls, the margin of its base being rapidly extended upwards. And in this case the heart beat at twenty pulsations per minute, but respiration was recommencing, the animal respiring slightly at intervals. And the force and rapidity with which the auricles contract, even admitting the great distensibility of the walls of the ventricle, could not overcome the resisting power and contractile energy, so as to produce distension of the ventricle, already partially filled, and the fibres everywhere in contact with the fluid contained, if the parietes did not dilate to receive the blood projected by the auricles. A smaller force could not overcome a greater.

In the fish the auricle is small and weak in comparison of the ventricle. In the frog also there is much difference between the strength of the auricles and that of the ventricle; and in warm-blooded animals the auricles are weak and unsupported by valves behind, and the current of blood which they project seems inadequate to overcome the contractile power of the ventricles if it did not act as a stimulus to their dilatation. The fact is, that in all these cases there is an adaptation in the ventricle to receive the blood which enters it—an opening up—an expanding or dilating power manifested by the parietes the moment the wave of blood from the auricle touches the ventricle; without which power the heart could never beat with the velocity and regularity it does.

When the dilatation of the ventricle is completed without an intervening pause, there are two forces in operation which can be distinctly seen in some animals. 1st. We have the auricles contracting and projecting the blood with great rapidity into the cavity of the ventricle. 2nd. We have the ventricle quickly extending its parietes, and stretching them upwards to complete the dilatation. It appears like a beautiful piece of mechanism—the auricle contracting and pouring the blood into the ventricle, and the ventricle opening up and extending its walls to receive it, and then contracting and propelling it along the aorta, whilst the auricles dilate and receive more blood from the veins.

When the circulation attains a degree of celerity that the ventricles dilate whilst the auricles contract, or as it is termed, that the dilatation of the ventricles is synchronous with the contraction of the auricles, it is evident the ventricle dilates and then contracts, or in other words, the contraction of the ventricle must be considered the result of the dilatation. If we keep this fact distinctly in view, and remember that we can discern the fibres of the ventricle stretched out to a certain extent during the dilatation, and drawn up and retracted during contraction, it will be seen that the dilatation of the ventricle is as much a vital act as its contraction.

What is the cause of the dilatation of the auricles? It cannot be produced by the force with which the blood is propelled by the veins, for the venous trunks contract but slightly, and the energy with which the diastole is performed excludes the idea of relaxation, affording every indication of a vital movement. But it appears to be much influenced by the quality of the blood that passes through the heart; for when more duly arterialized blood begins to circulate, the auricles dilate as well as contract with greater vigour. What is the cause of the contraction of the auricles? Is it that, being fully dilated, they are excited to contract? Then, why do they remain for a time filled with blood when the action of the heart is slow? There must be an intimate relation between the quality of the blood and the contraction of the auricles; for when the blood is imperfectly arterialized, they remain quiescent for a little after dilatation has taken place. But when the blood is more duly arterialized, they contract immediately on being dilated; and all this is produced whilst the animal remains at rest, only that the respiration has commenced and been carried on for a time.

We are well aware that the muscular fibres of the heart are considered to be so arranged as to produce contraction of the ventricle, but not to account for its dilatation. But great difficulty was experienced by the late Dr. Duncan, and also the late Dr. John Reid, in unravelling the muscular fibres of the heart in warm-blooded animals, so as to determine their specific action; and we have not as yet been able, from the arrangement of the fibres, satisfactorily to account for the tilting up of the apex of the heart during contraction of the ventricle. And though apparently opposed to the doctrine of muscular contractility, we are decidedly of opinion, from the evidence adduced, that the diastole of the heart depends on an actively dilating power—which power is clearly manifested during increased respiration, vigorous exercise, mental excitement, or whenever the action of the heart is accelerated.[a]

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[a] We may observe, that continued and increased action does not diminish the power of muscular contractility in the involuntary, as in the voluntary muscles of the body. "In the case of moderate exercise—of mental excitement—and in the course of different febrile and inflammatory diseases—we have examples of greatly increased

What is the cause of the continued action of the heart? This is a question that has much engaged the attention of physiologists. The heart it is well known will pulsate for hours in some cold-blooded animals after life is extinct and the circulation has ceased. The pulsations are continued at intervals after its removal from the body, when no stimulus is apparently present to excite its movements. We have seen in the fish an irregular action of the heart maintained for several hours after life was extinct, the auricle contracting frequently and the ventricle only at times. And these movements continued till the parietes began to dry and shrivel up, and then, after remaining quiescent for a time, a slight movement commenced in the central portion of the auricle, and extended to the ventricle, producing a slight contraction in that part of the ventricle in connexion with the auricle. After a short interval, when all was apparently quiescent, a slight movement was observed in the apex of the ventricle which extended an impulse to the base, and a similar movement, or partial contraction, occurred for several successive times, at the interval of about 30 seconds, the auricle remaining perfectly quiescent. If it be maintained that the atmospheric air acts as a stimulus to the heart when it is empty and deprived of blood, how does it happen that its pulsations are equally distinct and continued under the exhausted receiver of an air-pump? These facts would seem to imply that the heart possesses an inherent power of movement, and that its proper stimulus is the blood—the action of the heart being decidedly affected by the condition and quality of the blood that circulates through the system. Dark and unarterialized blood retards its movements, whilst duly arterialized blood increases its action; under its influence both the auricles and ventricles dilate and contract with great energy and vigour.

action of the heart, without any decidedly debilitating effect on the heart's action necessarily following. The doctrine of increased action, necessary in all cases, lowering or exhausting the irritability of muscles, particularly as applied to the involuntary motions, is therefore by no means an established principle."—Dr. Alison's Physiology, page 39.

Art. III.—*Temperature in Acute Disease.* Being a Thesis read, for the Degree of Doctor in Medicine, before the University of Dublin, June 26th, 1866. By Thomas Armetirding Compton, B.A. of Corpus Christi College, Cambridge; B.A. *ad eundem*, Dubl., and M.B., Dubl.; L.R.C.P., Lond.; M.R.C.S., Eng.

PART I.—ON THE PRACTICAL VALUE OF ACCURATE DAILY OBSERVATIONS OF THE TEMPERATURE OF THE BODY IN ACUTE DISEASE.

I shall not attempt to discuss the several theories of the production of animal heat, normal or abnormal, but will merely remark, that I have not, myself, found the actual excess of temperature, in typhus fever, to be proportional, as some assert, to the amount of urea excreted daily, and consequently am inclined to think that abnormal temperatures at any rate are not altogether due to tissue metamorphosis. My observations, however, on this matter, have not been sufficiently numerous to be of much value.

My object in taking up the study of temperatures has been mainly with a view to test their practical value for general use in ordinary practice, and consequently my observations have (with some few exceptions) been taken only once daily, but always as near to the same hour as possible. It would, no doubt, have been more advantageous had several observations been taken during the day at stated hours; but if the value of thermometric registrations generally depends only on a frequent observation of the temperature during the day, a thermometer would necessarily be of little use in private practice. I have, therefore, preferred to register one observation only daily, viz., about 2 p.m., at the same time noting down the state of the pulse, skin, respirations, and general symptoms.

The observations have been, without exception, made in the axilla, the superiority of this situation to that of any other being generally accepted, on account of the nearer approximation of its temperature to that of the blood in the vessels.

The general conclusions which I have come to, up to the present time, have been arrived at after a careful study of some 125 cases taken by myself during the last two years, at St. Bartholomew's Hospital, and also of some seventy-five other cases taken in the same hospital, during the same period, by Dr. Warter, a careful and accurate observer, to whom I am much indebted for the opportunity of using such valuable material.

I should here mention that during the past six months, the temperature of every case of acute disease, coming into the medical wards of the hospital, has been taken either by Dr. Warter or myself.

The total number of cases, then, in which the temperature and general symptoms have been watched and recorded daily throughout their course, amounts to 200, of which sixty are typhus, thirty typhoid, twenty pneumonia, fifteen scarlet fever, and the remaining seventy-five comprise cases of febricula, acute rheumatism, erysipelas, chorea, acute tuberculosis, &c. The total number of observations in these cases, and in others in which only one temperature has been recorded by Dr. Warter or myself, probably exceeds 5,000. As I shall have to speak of normal and abnormal temperatures, it will be necessary for me to state what I consider to be approximately the average normal temperature of an axilla in a healthy adult. A temperature of 98·4 Fah. is the point generally settled upon by the majority of authorities on the subject; but this, I believe, to be too high, as although I have not at present taken a sufficiently large number to decide the question to my own satisfaction (which I hope, however, shortly to be able to do), yet I can state that I have very rarely found such a temperature present in a healthy adult under normal conditions. I have every reason to think such a temperature to be nearly up to the maximum, consistent with health, and to be only met with occasionally, just as one comes across, now and then, a healthy adult with a temperature below 96° Fah. I consider the healthy range to be somewhere between 95°·5 and 98°·5 Fah., the most common temperature met with, being probably 97°·4 Fah., *i. e.*, one degree less than the temperature hitherto most generally received as the normal one.

The following then are the propositions I wish to establish:—

1st. That a continued daily temperature of 99° Fah., and upwards, indicates an unhealthy condition, and occurs in every case of acute disease. As I have never met with one case in which such a temperature was present, under normal conditions, in a healthy adult, and as every case of the 200 taken exhibits this state of temperature, the proposition may be considered to be proved.

2nd. That any one observation of a very high temperature (such as 105° Fah.), in any case in which the general symptoms do not appear of any particular severity, should lead to a very attentive re-examination, and suggest a very careful watching, especially if occurring in a non-diagnosed case; such a temperature being present only in severe forms of any disease.

In support of this I will mention the following case:—

W. B., aged twenty-nine, a well-nourished man, of rather sallow complexion, somewhat excited manner, having an occasional spasmodic way of speaking, complained, on admission, of sore throat, and on examination, both tonsils and the back of the pharynx, were seen to be considerably inflamed. He gave an imperfect history of having been ill about a week. This, at first sight, seemed to be merely a somewhat severe case of tonsillitis, and no further very minute examination, by the physician in charge, appeared to be immediately necessary. The case was therefore left for the history, &c., to be made out by the clinical clerk, before the visit next day, as is usual in such cases. Finding, however, the man's temperature to be 105°·4 Fah., I was interested in the case; and I made out, on further examination, the existence of partial trismus, and that the tongue, when protruded, deviated slightly towards the right side. Having mentioned this state of things to the physician, he returned again on purpose to see the case, when he found the symptoms still more severe, and considered the prognosis very unfavourable.

This man, morever, died on the next day, some twelve hours after admission, the case being one of septicemia.

Another equally important case of cerebro-spinal meningitis, in a girl of eighteen, was thought by many who saw it on admission, to be one of hysteria; but here a temperature of 103°·5 Fah. was quite sufficient to negative such an idea.

This case also terminated fatally.

3rd. That the thermometer is of great use, as a means of diagnosis in those cases, which frequently present themselves, of general *malaise*, often accompanied by a history of rigors, loss of sleep, &c.; such symptoms being due either to the commencement of one of the specific fevers, or merely to some gastric or uterine disturbance of a temporary character.

In these cases it is often at first impossible to decide, judging only from the pulse and general symptoms; but if the state of the patient be due to the more serious cause, we shall invariably find an abnormal temperature; and on the other hand if due to any other, a normal temperature, will be often met with, frequently accompanied by a very rapid pulse. I have never met with one case in which, the temperature being normal, specific fever afterwards developed itself, and although I have nearly twenty examples of this proposition, I will only bring forward one.

E. J., aged twenty-four, a nurse in a ward in which there were several cases of typhus and typhoid fevers, is a well nourished and generally healthy women. The cheeks are flushed, conjunctiva slightly suffused, tongue covered with thin fur, and inclined to dry; bowels have been loose the last three days, and were open five times yesterday. She complains of frontal headache, pains in all her limbs, want of sleep, loss of appetite, &c. Has not felt quite well for about a week, but continued at her work until yesterday. She "felt very cold all over" three days ago, and sat over the fire, but could not get warm. Her pulse is 72; temperature, 97° Fah. The next day, and the day after, she exhibited much the same symptoms; her pulse, however, going up to 120 and 100 on the two days respectively, whilst the temperature remained steady between 96° and 97° Fah. Two days afterwards she was quite convalescent, and about the ward again. This case bore as strong a resemblance to that of an early stage of typhoid fever as it was possible to do, and for the first few days many considered it to be one of this disease.

A point of great interest in connexion with this case was the fact that some three months afterwards the patient had well marked typhus, with a temperature of 103° Fah., and a pulse of 120 on the fifth day, which was the first time I had an opportunity of seeing her on this occasion.

4th. That the temperature in every disease has a tendency to run a peculiar course, and has a certain range of altitude, a knowledge of which course and range is of great value as an assistance to us in diagnosis and prognosis.

In connexion with this proposition I should observe that I have not found the temperature in acute disease to be perceptibly affected by the season of the year at which the disease may have occurred, although the temperature of the wards during the year has varied to a considerable extent.

Again, if cases of similar severity at different ages be compared, the altitude attained by the temperature in any disease does not appear to be influenced by the age of the patient, although normally is generally reached somewhat earlier in children than adults.

I have drawn up some charts to show the course of temperature as observed by myself in typhus, typhoid, and scarlet fevers, pneumonia, acute rheumatism, erysipelas, and tonsillitis.

These diagrams are not founded on any average, but merely represent actual typical cases. I have preferred to adopt this plan on account of the fallacies likely to exist in such tables if drawn up from averages. Errors in establishing the exact day of the disease are, in many cases, unavoidable; but these, although only to the extent of a single day, might considerably affect the ultimate result in any general average.

Having discussed typhus and typhoid at some length in another paper I shall not further allude to them. To the other diseases (the course of temperature in which I have endeavoured to illustrate by diagrams) I will briefly refer.

In pneumonia we have high temperatures as early as the second day, with the maximum generally on the third or fourth, and a sudden fall (of perhaps 5° Fah.) to normal on the seventh or eighth.

In acute rheumatism we have a long-continued slightly abnormal temperature, generally ranging beeween 99° and 102° Fah., and very rarely reaching 103° Fah.

Erysipelas is characterized by very sudden changes of temperature; thus, we often get an alteration of 4° or 5° Fah. in twenty-four hours, and occasionally a fall of 7° or 8° Fah. in the same period. I have observed in several cases that a considerable fall has taken place immediately on the appearance of the characteristic redness.

The temperature of tonsillitis is especially interesting when compared with that of scarlet fever; and as the diagnosis in the early stage between the two is often doubtful, we may frequently be much assisted by the observation of the temperature.

In tonsillitis the temperature in the middle of the day, when at its maximum, which is generally attained about the fourth day, rarely exceeds 100°·5 Fah.; and this occurs with a pulse often below 100. Normal is reached about the sixth or seventh days.

In scarlet fever, on the other hand, the maximum is arrived at about the third day, when the temperature is generally 104° Fah., whilst the pulse is considerably above 100. The normal is not usually attained until the tenth or twelfth days.

Although I have taken a few cases of many other diseases besides those just mentioned, yet I have preferred, at the present time, to confine myself to the examination of the course of temperature in these seven only, considering that my experience of this subject in any other disease has not at present been sufficient for me to judge fairly of it. I would, however, just allude to the possibility of temperature being of great assistance to us as a means of diagnosis between typhus fever with severe cerebral disturbance (when occurring without any rash), and purely cerebral cases of meningitis or cerebritis. I have only had an opportunity of taking the temperature of two purely cerebral cases, but in both of these the temperature rarely exceeded 101° Fah., whereas with similar symptoms due to typhus fever, we might have expected the thermometer to stand some 3° higher.

I should also state that the highest temperature I have ever taken was 107°·2 Fah., and occurred in a case of pneumonia following tracheotomy; the next highest was 106°·2 Fah., in erysipelas; generally, however, temperatures above 105° Fah. have been rarely met with.

I will conclude this part of the subject by bringing forward a case to prove the value of a knowledge of the course and range of temperature in different diseases.

A boy of fifteen was admitted with general *malaise* and sore throat. His tonsils and the back of his pharynx were somewhat inflamed, but his tongue was moist and nearly clean.

After the first few days he complained of nothing except weakness, although his voice continued very husky. His appetite remained pretty good throughout, and he slept well. About the fifteenth day he had some bronchitis, and on the sixteenth some hemorrhage, with a loose motion; previously his bowels had been somewhat confined. The hemorrhage did not recur. There was never any rash or abdominal tenderness, and the physician in charge of the ward considered the patient's illness to be due to the apparent symptoms manifested, viz., the sore throat, with probably some laryngeal mischief, and the thoracic complication.

The course of temperature was that of typhoid fever throughout; and at the time I mentioned this fact to several, but little expected to be afforded any corroboration of my statement, as the lad's temperature fell to normal on the twenty-eighth day; and two days after this he was up and about the ward.

However, as the case was not considered to have been one of typhoid fever, there was no especial necessity to be careful with his diet, and he was placed on meat diet. Having a very hearty appetite he did good justice to the food allowed him, besides partaking of some extras which were surreptitiously conveyed to him by his friends. The consequence was, to use his own expression, he went to bed "feeling very well," but "very full." Some hours afterwards symptoms of colic came on, which, not being relieved by the appropriate measures adopted, were followed by those of peritonitis of which the lad died on the seventh day from his seizure.

The *post mortem* disclosed a quantity of purulent fluid in the peritoneum, and numerous ulcers of Peyer's glands; the majority of which had already cicatrized, but in many the healing process was still going on. The peritonitis had been caused by an overloaded intestine, previously weakened, the colon being completely stuffed with scybala. There was no perforation.

5th. From the last proposition it follows, that the same altitude of the thermometer attained at one period of any disease is not of the same importance as the same height reached at another time in the same disease.

Thus, in typhoid fever, a temperature which has been rising for two or three days, reaches perhaps 104 Fah. between the seventh and fourteenth days, without causing any anxiety; whereas should the same phenomenon occur about the twenty-eighth day, a fatal termination may probably be expected.

And again, the actual altitude attained on a certain day in one disease is not of the same importance to our prognosis as the same height reached on the same day in another disease. Thus, a temperature of 104° Fah. in erysipelas is very common during the first week, and need not give rise to any alarm; but should such occur at the same date in acute rheumatism I should consider it of much more importance.

6th. That although, in all diseases, a high range of temperature generally indicates a severe case, with a slow convalescence, and a low range usually occurs in a mild case, and is followed by a rapid convalescence; yet there is no actual temperature in any disease which necessarily foretells a fatal termination. Thus I have registered 105°·6 Fah. in a severe case of typhus ending favourably, 106°·3 Fah. in erysipelas, 105°·3 in typhoid; and each of these temperatures was the highest I ever took in the respective diseases.

I certainly once registered a temperature of 107°·2 Fah., in a fatal case of pneumonia; but the great majority of fatal cases generally, although always exhibiting abnormal temperatures prior to collapse, have by no means had any extraordinarily high ranges.

I believe that an abnormal course of temperature is more often the precursor of a fatal termination than any universally high range.

7th. That in the majority of cases a rise of temperature is contemporary with a rise of pulse, although such is often not a proportional one, and may not take place at all unless the alteration in temperature be as much as 1½° or 2° Fah.

Cases of typhus are, perhaps, the best examples of the simultaneous alteration of pulse and temperature.

8th. That where the temperature and pulse together do not coincide with the general symptoms, the two former may be generally relied on as to the actual state.

Thus, in typhus, towards its close, we often get a continuous fall of temperature and pulse for perhaps three or four days before there is any improvement in the general symptoms; and in these cases the two former always foretel rightly.

There is, however, a well marked exception to this rule in the later stages of typhoid fever, as mentioned in another paper.

9th. That where the temperature and general symptoms agree together, but do not coincide with the state of the pulse, the two former may generally be relied on as to the actual state.

Thus in cases of hysteria, and in cases of excitable persons approaching convalescence after fever, we often suddenly get a very high pulse, which is sometimes continuous for days, although the temperature and general symptoms are neither of them adverse.

10th. That in those cases in which the pulse and general symptoms remain the same, a moderate fall of temperature on one occasion is not to be relied on; but should such a fall continue in a moderate and gradual manner, for some days, and at such a period when a fall was to have been expected, the temperature may then be depended upon. Severe cases of typhus, towards their close, often give examples of this sort.

In those cases, however, in which the pulse continues frequent, and the general symptoms are severe and without improvement, a considerable fall of temperature (say 5° or 6° Fah.) is to be regarded with anxiety, being probably due to some internal hemorrhage, or to the commencement of a state of collapse.

Thus in a case of icterus, in a girl of fifteen, due to obstruction of the common duct by a hydatid cyst, and accompanied by peritonitis, on the three days preceding death, the pulse had stood at 140, 140, and 136 respectively, the temperature having been on the same days 104°·2, 104°·5, and 99° Fah.; whilst the general symptoms continued without alteration. Here, on the last day, we got a sudden fall of 5½° Fah., which was the first sign of collapse terminating in death some twenty-four hours afterwards.

Again, in a case of typhoid fever, on the seventeenth day there was a sudden fall of 4° Fah. from the preceding day in consequence of considerable internal hemorrhage.

11th. That in those cases in which the pulse and general symptoms continue the same, being the one frequent and the other severe, a continuous rise of temperature for some days, occurring at a period of disease at which some improvement might generally be expected, is usually the precursor of a fatal termination.

Thus, in a case of typhoid fever, terminating fatally on the thirty-sixth day, the pulse and general symptoms continued without change until the thirty-fifth day; the former having stood at 92 on the twenty-ninth day, remained steady and rather below that frequency until the thirty-fifth day, when it suddenly rose to 124. The temperature, however, rose continuously from the twenty-ninth day, nearly a degree a day, until it stood 5° higher on the thirty-fifth than on the twenty-ninth day—the height registered on the thirty-fifth day being 104° Fah.

12th. That although it is possible that the state of the temperature alone in acute disease may, perhaps, hereafter prove to be the one safest symptom to rely upon if taken by it itself (and I believe it is at present, at least, equal to the state of the pulse, and of greater value than this certainly, if only its frequency be taken into account), yet the temperature must be considered merely as an aid, and all other symptoms must be carefully examined into, as it is on comparison with these that its greatest value is always to be found.

The preceding propositions, which are not intended to be put forward as dogmatic rules, being merely the result of a very limited experience, and being probably only approximations to the real truth, which is always deep down "at the bottom of a well," imperfect though they be, nevertheless contain, I think, amply sufficient to prove the great value of the daily observation of the temperature in acute disease.

I will now refer to those who disregard the value of the clinical thermometer, and amongst these are many of high authority, whose opinion is entitled to great consideration.

What, then, is the reason of the disregard of such? 1st. Some do so because they allege that they can sufficiently distinguish by their hands normal and abnormal states of temperature, and can carry such sensations in their minds, or commit them to paper under such expressions as "cool," "moderately cool," "warm," "hot," "very hot," "pungently hot," &c.

The fallacy of these expressions can, however, be easily ascertained by any one who will take the trouble, in a few acute cases, first to write down his sensations, and then take the temperature by a thermometer.

Heat and cold are only temperature sensations, and as our hands vary considerably in their temperature, it follows that a body submitted to a hand, the temperature of which is 95° Fah., will refer to the mind a very different sensation to that which it would do were the temperature of the hand 10° or 20° lower.

As an example of this fallacy, I will only mention the following fact:—

I have heard a physician of high standing observe that the skin of a patient was "moderately cool," when the actual temperature in the axilla was 104° Fah. This is by no means an uncommon occurrence. 2nd. There are some authorities who state that an abnormal temperature generally does not occur at all in cases of acute fever, and on this account undervalue the thermometer.

I can, however, honestly state that I have never met with one such case, neither have I found any one who has used a thermometer who has done so, except the patient were in a state of collapse just prior to death.

Consequently, with all due deference to such authorities and their statements, I am strongly inclined to think that the actual existence of such cases is more than doubtful; and if the temperature of a patient which is really 104° Fah. can be called "moderately cool," it will not be difficult to understand how such cases have been supposed to occur.

3rd. There are others, again, who disregard the value of the thermometer because they think they have tried it and found it wanting.

These have tried it certainly, according to their own manner, but generally with utterly wrong and probably self-conceived ideas as to its use. They have started on their trial with the belief that the abstract degree of heat was all that they had to consider. Such as these, consequently, soon find out that a thermometer will lead them into all sorts of blunders, and properly discard it. But would these be merely content with considering the height of frequency to which the pulse had attained, without taking into account its volume, regularity, its condition yesterday, the disease and the individual in whom it occurred?

Well, then, some very similar conditions must also be considered before placing an actual value on any one observation of temperature—thus, the disease, its period, its height yesterday, &c.; and without reflection on these points, any observation will be useless indeed.

It would, no doubt, save a great deal of trouble if we could decide our prognosis and diagnosis by means of the temperature alone, and also without any practice or experience in the use of the clinical thermometer; but would any one discard the stethoscope merely because some experience in its use was required before any one could be in a position to place a value on the sounds he might hear, or because, even after considerable practice, the value of some sounds (such as certain cardiac murmurs) still remained doubtful?

In the same manner, a person must have some amount of practice with the thermometer before he is in a fit position to put an actual value on any one observation; and any error in diagnosis or prognosis which a beginner may make will be due probably to this wrong interpretation of a certain fact.

The greater his experience the less will be the chance of such an error, and the more valuable will his thermometer be to him.

I will just give two examples of numerous mistakes liable to be made by this class of objectors.

A case of febricula presents itself, and a very high temperature is found within a few hours of the first symptom of *malaise.* The observer in question necessarily thinks that his patient must be suffering from a very severe form of fever, probably typhus, and is proportionally anxious, but in forty-eight hours perhaps, to his delight and astonishment, the temperature is again normal, and the patient convalescent. Such an observer, having considered only the abstract degree of heat, immediately discards his thermometer, although his error of diagnosis and prognosis was due to the wrong interpretation of a fact. Had his experience been greater, the very fact which so alarmed him would have had probably an exactly opposite effect, for he would have known that the disease could not at any rate be typhus fever.

Again, to take an opposite example.

In a case of typhoid fever, in which the general symptoms are severe, the temperature, which has been fluctuating about 103°

Fah., suddenly drops 4° or 5° without any improvement in the general condition of the patient.

Such observers, considering only the abstract degree of heat, regard the altered state of temperature as a favourable sign, and are surprised at, very possibly, finding the patient dead on their next visit. Had they had more experience, they would have known that such a fall was a very unfavourable symptom under the circumstances, being probably caused by intestinal hemorrhage, or else being the commencement of a state of collapse; as in typhoid fever, the general symptoms improve considerably before the temperature reaches normal. All the blame of such unfortunate prognoses is, of course, laid on the thermometer, instead of on their own ignorance and rash judgment.

The above are examples of the misuse of the instrument, in the use of which we must always be very careful not to jump at conclusions, but strive honestly to arrive at the proper interpretation of the additional fact which we have just registered; by so doing we shall, by its assistance, reap an abundant reward in a more successful diagnosis—a more confident prognosis.

In conclusion, I am convinced that the study of the thermometry of disease is as yet in its infancy; and believing that such a study, instead of teaching any disregard for the pulse, or other important symptoms (as some have wrongly supposed it was intended to do), will further enhance their value, and generally conduce to a more attentive examination of each symptom manifested in acute disease, I consider the subject to be one well worthy the attention of every member of our noble profession, and one which will amply repay the few extra moments spent at the bedside.

II.—A CONSIDERATION OF THE COURSE OF TEMPERATURE AND PULSE IN TYPHUS AND TYPHOID FEVERS, AND SOME OF THE POINTS OF DIFFERENCE BETWEEN THESE TWO FEVERS SHOWN THEREBY.

The cases from which the following data were ascertained occurred in St. Bartholomew's Hospital during the last two years, and daily observations were taken of them either by Dr. Warter or myself.

The number of cases amounts to sixty of typhus and thirty of typhoid.

I should here state that in the great majority of these cases only one observation daily was recorded, but always as near to the same hour (viz., 2, p.m.) as possible.

In consequence of this fact I shall not be able in the present paper to compare the morning and evening temperatures of the two diseases, but will now merely remark, that although the differences between the morning and evening temperatures of typhoid seem to be greater than between those of typhus fever, yet the altitude attained by the thermometer at 2 p.m. has in both diseases appeared to be nearly the mean, between an observation taken at 9 a.m. and one at 9 p.m. I have, however, not had sufficient experience on this particular point to speak with confidence on the subject. I propose in the first place to consider typhus and typhoid fevers separately, and then to examine their points of difference.

Typhus, as met with under the above-mentioned circumstances, seems to occur generally in two forms:—1st. The milder form, the subjects of which are children, or previously healthy adults under thirty, who have led sober and regular lives; 2nd. The more severe form, which has been the one somewhat the more frequently met with. This has occurred either in persons of a more advanced age or in younger adults of unsound condition from previous disease, or in consequence of intemperate habits.

In both of these forms the temperature rises in a more or less regular manner to its maximum, when it falls continuously about a degree a-day until the normal is reached; and although having further fallen below this, it may rise to regain its ordinary height, it will not again exceed this point unless some complication be at hand.

In all cases, also, of either form there is a very uniform temperature of about 104° Fah. on the seventh day; with this exception there is no temperature peculiar to any one day.

In the milder form of the disease the pupils are seldom contracted; the tongue, although generally thickly coated, never exhibits the dry, brownish-black fur of the more severe type; subsultus is not often, floccitatio very rarely present; the delirium (which occurs only at night) is slight, and the rash is not usually very copious. In such the general range of temperature is comparatively low, the termination of the case is, without exception, favourable; and the convalescence, which may be said to begin about the fourteenth day, is rapid.

The temperature attains its maximum on the seventh or eighth days, the average maximum being 103°·7 Fah., the highest registered 104°·3, and lowest maximum 102°. The normal is reached on the twelfth or thirteenth days.

In the more severe form we often find contracted pupils, a dry, brownish-black tongue, with sordes on lips and teeth, great subsultus and muscular tremors, often floccitatio, delirium frequently present by day as well as night; and towards the termination of the case, a semi-comatose condition often comes on, which occasionally alternates with severe delirium at night. The rash in these cases is generally copious. Under this form I include those exceptional cases of typhus which are attended by considerable diarrhea; these occur in about ten per cent. of all cases, and do not in any other respect differ from ordinary severe cases of the fever.

In the severe form, then, the range of temperature is high, the termination not always favourable, and the convalescence, which does not begin until the end of the third week, is very tedious.

In these cases the maximum temperature is attained between the seventh and tenth days (generally on the seventh or eighth), the average maximum is 104°·4 Fah., highest registered 105°·6 Fah., lowest maximum 103°. Normal is reached between the fifteenth and eighteenth days, both inclusive.

High temperatures, such as 105° Fah. and upwards, do not foretel fatal terminations; but high ranges, generally, at the commencement of cases foreshow severe attacks, and are invariably followed by long convalescences. Fatal cases always exhibit abnormal temperatures prior to collapse, but not necessarily very high ones. Judging from the fatal cases I have witnessed, I believe that an abnormal course of temperature much more generally precedes a fatal termination than any unusually high range.

Such cases have appeared to differ from the ordinary run of severe attacks terminating favourably in one or more of the following ways:—

1st. They exhibit a temperature of only 102° or 103° Fah. about the sixth day, which is below that generally met with even in mild cases; and considering the severity of the symptoms we should expect to find a temperature nearly 2° higher at such a date.

2nd. They have a constant temperature of about 102° Fah. for a week or more.

3rd. They exhibit a fall of perhaps 3 or 4° Fah. on some day on which, in an ordinary severe case, we should not expect any such fall (say on the tenth day).

4th. They have a temperature of about 104° Fah. as late as the sixteenth day, when even in severe cases the normal ought to be nearly reached.

The pulse generally in typhus rises and falls with the temperature; and between the fourth and ninth days is above 100, often very considerably so; its maximum is reached rather later than the temperature, and normal is attained some two or three days after this point of temperature has been arrived at.

It may, however, especially in persons of nervous temperament, be kept up beyond this date.

In typhus a temperature of 99°·5 Fah. corresponds to a pulse of about 100, a temperature of 100°·5 Fah. with a pulse of 105 and so on; an alteration of five beats of the pulse corresponding to each degree of alteration in the temperature.

In the majority of cases, however, unless the alteration of temperature be upwards of one degree, we shall find, probably, no corresponding increment or decrement in the pulse, and the above only holds good in a general sense.

I have, however, noted down each variation of 2° and upwards in all cases of typhus which I have, in order to ascertain the contemporary behaviour of the pulse; and find that every such variation was attended by a corresponding alteration in the pulse of an average of five beats for each degree. There were only five exceptions to this rule out of the whole number, and in two of these the variation in pulse occurred the next day without any corresponding alteration in temperature.

In concluding these observations on typhus fever I should mention that by far the most frequent complication in these cases was bronchitis, coming on about the twelfth day.

Considerable feebleness of the cardiac systole and impulse was also noticed in several instances.

The fatal cases amounted to about twelve per cent., and occurred either within the first week or else between the twelfth and sixteenth days.

In the former case the deaths seemed to be due to the intensity of the fever poison itself, and in the latter to the circulation in the system of the products of tissue metamorphosis. In only one case, however, were typical uremic convulsions observed. These fatal cases occurred in patients over 40, or in adults above 25 who had led irregular lives. The proportion of male to female deaths in the same number of cases was 7 to 5.

At the *post mortem* examinations of these cases ulceration of

Peyer's glands was never present, and the only peculiar appearance noticed was a dark fluid condition of the blood, and occasionally a dark and abnormally dry condition of the muscles. In one case there was a remarkable effusion of dark fluid blood into the substance of the recti muscles of the abdomen.

The enlarged congested liver and large soft pulpy spleen have been met with both in typhus and typhoid. I will now proceed with the consideration of typhoid fever, which has been met with under two forms of such unequal severity, that I propose for convenience sake to divide the cases as I have done those of typhus, into two classes; one comprising the milder, the other the more severe form.

I should, however, observe that although a severe case of typhus may often be foretold at an early period, yet it is impossible to do so at a similar date in typhoid fever; as I have observed several in which the mildness of the symptoms during the first week or ten days might have augured an early convalescence, eventually turn out of the most protracted character.

In typhoid fever the temperature generally rises, after numerous daily fluctuations, to its maximum; and having attained this point exhibits the same characteristic irregular decline, falling perhaps for two or three consecutive days, and then rising again for two or three more, and so on; the fall, however, preponderating over the rise, until the normal is reached, after which daily fluctuations will probably continue for a few days longer. The majority of cases come under the first mentioned form, ultimately proving of moderate severity, and terminate favourably towards the end of the third week.

In these the pupils are slightly dilated; the tongue, although inclined to dry, and generally abnormally red at the tip and edges, often continues nearly clean throughout. A very common form of tongue which I have observed in such cases has a rather dryish patch, in the form of an isosceles triangle (the base of which is at the tip), running up the centre, with two moist strips of thin white fur on either side. Subsultus and tremors in these cases are rare, and delirium (as often absent as present) is usually very slight, and comes on during the night only. Intestinal hemorrhage does not occur, and thoracic complications of importance are rare.

In these the temperature attains its maximum between the seventh and eleventh days (but this is not reached more frequently on one day than on another); the average maximum is 103·3 Fah.;

highest registered 104°·5, lowest maximum 102°·2 Fah. The normal is arrived at between the fifteenth and twenty-first days.

In the more severe form we generally find that either intestinal hemorrhage occurs during the course of the case, or that we have to deal with a low form of pneumonia, which is a frequent complication, and one which not uncommonly is the immediate cause of death at an advanced period of the fever.

In these protracted cases we get, towards the later stages, dilated pupils, a tongue which is either covered with brownish black fur, and dry, or one which has its central surface glazed, edges and tip red. In both of these transverse furrows may generally be observed. Subsultus and tremors may also be met with, but very rarely floccitatio ; delirium, usually of a low form, is pretty constant at night, but rarely present during the day.

In such cases which terminate favourably the temperature reaches its maximum between the nineteenth and twenty-first days, the average maximum is 104°·1 Fah.; highest registered 105°·2, lowest maximum 103°·8 Fah. The normal is reached usually between the twenty-third and thirty-fifth days.

In typhoid fever a high range within the first fourteen days generally foretels a severe and protracted case, but a low range during this period does not necessarily foreshow a mild case, even if the general symptoms be also favourable.

A sudden fall of several degrees, especially if occurring in a severe case, about the end of the second week, and without improvement in the general symptoms, is to be considered with anxiety, such decline being probably due to intestinal hemorrhage, or to the commencement of a state of collapse.

In such an event the pulse, which very likely up to this time may have kept below 100, usually rises suddenly twenty or thirty beats.

In these cases, when the patient does not immediately succumb, the fall in temperature and rise of pulse are frequently followed, within the next twenty-four hours, by opposite phenomena, the temperature rising higher than the point at which it previously stood whilst the pulse falls considerably.

Again, if we meet with a case in which the general symptoms continue severe, but the temperature, although an abnormal one, fluctuates for some days at a point disproportionally low when compared with the general symptoms, we must consider such low range in an unfavourable light rather than the opposite; especially ought this behaviour of the temperature to be so interpreted if it occur in a case of which the date of the commencement of the fever is unknown or doubtful, and in which the period may then be as late as the end of the third or the fourth week.

Almost without exception in cases which terminate favourably, we find that the general symptoms reach their normal, if I may so speak, several days before the temperature; and although until all fluctuations of the temperature above "the normal" have ceased, the patient cannot be considered safe from liability to a relapse, and great care must be still taken with his diet; yet we may expect in the majority of cases, that if the general symptoms have thus improved we shall have a favourable issue, notwithstanding the slight fluctuation of the temperature above "the normal."

It is the knowledge of this fact that causes us to look with suspicion on cases in which the normal temperature is apparently about to be arrived at before the improvement in the general symptoms. Fatal cases often exhibit a continuous, although often slight, daily rise in temperature for four or more days previous to collapse, and this may occur without any corresponding alteration in the pulse, or without any decided change in the general symptoms.

As we know that a continuous rise for four or more successive days is not met with generally in cases which end favourably, such a rise should put us on our guard.

In typhoid the pulse, to a considerable extent, fluctuates with the temperature, although the exceptions to this rule are much more frequent than in typhus.

However, generally speaking, an alteration of about five beats of the pulse occurs for each degree of alteration in the temperature. Thus, a temperature of 99°·5 Fah. will correspond to a pulse of 90; a temperature of 100°·5 with a pulse of 95, and so on.

The range of pulses which may be found in different cases, to correspond to the same degree, is, however, very great; thus, between 102 and 103° Fah. I have met with pulses between 80 and 154.

High pulses in typhoid fever do not often occur in adults; and when such are not clearly due to some manifest complication, there seems some reason for believing that tubercular deposit in the lungs, or the general state of tuberculosis, is the cause of this phenomenon.

Fatal cases have occurred in 13 per cent of all cases, and the proportion of male to female deaths, in the same number of patients, was as 5 to 4. Death took place on the fifteenth, thirty-fifth, and thirty-sixth days, and also in one case on the sixteenth day, of a relapse; besides these cases, the date of death in another patient could not be ascertained, but it was not earlier than the fifteenth day, and very probably took place at a much more advanced period of the disease.

The cause of death was due either to peritonitis, a low form of pneumonia, or asthenia.

In all there was well marked ulceration of Peyer's glands. A low form of pneumonia was the most common complication, and in several cases the fever commenced with some inflammatory affection of the throat.

In all cases diarrhea was all but universally present, at some time in the course of the fever, although in many constipation prevailed for the first fortnight.

Considerable hemorrhage occurred in four cases. Relapses took place in 12 per cent. of all cases. I will now conclude by summing up the differences most frequently observed between these two fevers, as far as their pulses and temperatures are concerned.

1st. The range of temperature is somewhat lower in typhoid, in which, however, a continuous abnormal temperature is of much longer duration.

2nd. The defervescence of typhus is regular and continuous, the temperature falling generally about a degree a day, until the normal is reached; whereas in typhoid, the fluctuations from day to day are considerable, and the fall is not a continuous one daily.

3rd. There is a great tendency in typhus to attain certain temperatures, and to reach certain points in its course, on certain fixed days. Thus, in the great majority of all cases, a temperature of about 104° Fah. is met with on the seventh day; in a very large per centage the maximum is reached on the seventh or eighth days; the normal is generally attained, in mild cases, on the twelfth or thirteenth days; and in more severe ones between the fifteenth and eighteenth days.

In *typhoid* there is no particular temperature generally arrived at on any one day; the maximum may be reached at any time between the seventh and twenty-first days; and normal is attained, in mild cases, between the fifteenth and twenty-first days; whilst, in the more severe ones, it may be attained on any day between the twenty-fourth and thirty-fifth.

4th. The pulse is generally less frequent in typhoid; and although in both fevers the pulse usually fluctuates with the temperature (about five beats of pulse corresponding to each degree of alteration in temperature), the frequency of the pulse in the two, for the same degree of altitude, is different.

Thus, with a temperature of 100°·5 Fah., we shall get an average pulse of about 105 in typhus, but of only 95 in typhoid, and so on; at each degree the pulse being about ten beats more frequent in typhus than in typhoid. Moreover we sometimes meet with a case of typhoid fever in which the pulse very slightly exceeds normal throughout, but such a case I have not observed in typhus.

5th. In typhus the temperature reaches normal two or three days before the pulse, and the general symptoms often continue severe several days after the pulse and temperature are both normal. In these cases, however, if the defervescence has been regular, and has occurred about the usual period, the case will terminate favourably, notwithstanding the often very unfavourable condition of the patient.

In typhoid, on the other hand, as I have before mentioned, the temperature keeps up several days after the general symptoms have been considerably improved, and we must look, with doubt rather than otherwise, on cases in which this rule appears about to be broken—that is, on cases in which the general symptoms continue severe, although the temperature is but little, if any, above the normal.

6th. Relapses of typhoid have occurred in 12 per cent. of all cases, and in these the temperature ran a similar course, as in the former attack, although at a somewhat lower range.

Relapses of typhus, with a corresponding recurrence of abnormal temperature, have never been met with, although the number of cases of typhus under observation has been double that of typhoid.

The following twelve tables[a] contain the details of observations on as many selected cases; of temperature, pulse, and respiration, and will serve to illustrate the general method employed:—

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[a] These tables have been deduced from the charts referred to at p. 63.

I. Typhus Fever (severe form).
William Birch, aged 21.

Day	Temperature	Pulse	Respiration
8	104°·0	114	30
9	103·1	126	40
10	102·0	120	40
11	103·3	128	45
12	104·0	130	40
13	103·0	124	40
14	102·0	100	28
15	101·3	94	24
16	99·8	86	22
17	98·0	84	18
18	97·6	66	18
19	96·8	78	20
20	97·5	62	18

II. Typhus Fever (mild form).
Martha Sheet, aged 18.

Day	Temperature	Pulse	Respiration
6	102°·7	—	—
7	103·6	141	40
8	103·8	144	36
9	102·4	138	40
10	100·4	126	40
11	98·8	120	36
12	97·6	115	36
13	97·6	108	24
14	97·6	82	24

III. Typhoid Fever (severe form).
William Williamson, aged 15.

Day	Temperature	Pulse	Respiration
8	103°·5	108	36
9	102·5	100	28
10	101·5	96	36
11	101·6	104	32
12	104·0	100	36
13	103·0	110	32
14	101·1	106	30
15	101·1	114	30
16	103·5	108	40
17	105·0	128	36
18	100·5	106	30
19	101·2	96	34
20	100·0	92	32
21	98·5	94	36
22	98·3	96	34
23	98·2	82	30
24	100·2	94	32
25	99·8	86	36
26	98·4	84	34
27	98·6	76	25
28	97·5	88	30
29	100·0	94	36
30	98·1	78	24

IV. TYPHOID FEVER (mild form).
Sarah Langton, aged 14.

Day	Temperature	Pulse	Respiration
8	102°·2	114	—
9	101·2	105	—
10	102·1	101	—
11	101·3	99	—
12	101·3	126	—
13	100·0	93	—
14	101·4	111	—
15	101·9	117	—
16	99·0	108	—
17	99·9	99	—
18	98·2	114	—
19	100·4	120	—
20	96·0	81	—
21	98·5	93	—

V. SCARLET FEVER.
William Howell, aged 3½.

4	103°·5	144	30
5	103·0	160	30
6	100·3	120	32
7	99·0	114	26
8	98·5	118	26
9	98·9	118	24
10	98·3	—	—

VI. SCARLET FEVER.
Alice Kirke, aged 5.

Day	Temperature	Pulse	Respiration
3	104°·2	162	—
4	104·1	147	—
5	101·2	122	—
6	100·0	106	—
7	99·1	120	—
8	99·1	120	—
9	99·6	118	—
10	99·8	102	—

VII. FACIAL ERYSIPELAS (mild).
Caroline Phillips, adult.

3	99°·2	102	21
4	102·9	104	24
5	99·7	114	32
6	103·2	120	32
7	99·0	96	32
8	100·0	96	24
9	97·3	90	32
10	96·5	71	24
11	94·2	81	32
12	96·0	75	28
13	95·3	57	32
14	96·2	54	24
15	95·3	51	24

VIII. Facial Erysipelas (severe).

Day	Temperature	Pulse	Respiration
6	104°·3	108	26
7	105·2	116	24
8	98·2	72	20
9	100·0	105	24
11	94·0	82	16
12	101·5	102	16
13	97·0	90	24
14	97·2	75	20
15	95·8	56	16
16	97·8	78	24
17	96·2	66	24
18	99·9	87	24
19	96·0	60	24
20	96·9	62	20
21	95·9	—	—
22	96·2	—	—
23	95·8	—	—

IX. Tonsillitis.
Eliza Halse, aged 13.

Day	Temperature	Pulse	Respiration
4	100°·0	92	20
5	99·2	80	20
6	98·7	88	24
7	97·5	82	24

X. Tonsillitis.
Sarah Baker, aged 16.

Day	Temperature	Pulse	Respiration
3	100°·7	120	30
4	101·0	122	25
5	100·0	112	28
6	98·3	94	22

XI. Pneumonia.
Sarah Baker, aged 16.

Day	Temperature	Pulse	Respiration
2	102°·8	120	48
3	104·8	122	42
4	104·0	136	48
5	104·2	136	56
6	98·7	96	42
7	98·2	88	36
8	95·8	80	36

XII. Acute Rheumatism.
Female, aged 34.

Day	Temperature	Pulse	Respiration
8	101°·7	108	18
9	100·8	108	20
10	100·7	100	20
12	101·5	100	20
13	101·3	100	20
14	101·1	94	22
15	100·5	96	22
16	100·6	96	22
17	100·2	108	22

Art. IV.—*The Medical Uses of Chloroform Inhalation.* By Charles Kidd, M.D.; M.R.C.S.E., London.

The medical uses of chloroform, or rather its administration in medical as contrasted with surgical cases, begins to assume a form of very considerable interest and importance to the practising physician—not so much as an agent capable of removing slight or severe pain in neuralgic or purely spasmodic affections, as in controlling dangerous convulsions in the adult or infant, as a remedy also, or auxiliary of great usefulness in various forms of epilepsy, though not so effectual in simple hysteria, chorea, or delirium tremens. The medical uses of chloroform, in a word, have not been recognized sufficiently; its far wider and more brilliant aid to the operating surgeon having somewhat eclipsed its occasional applicability in the less demonstrative clinical wards of the physician. In cases of puerperal convulsions—which come under the notice of the general practitioner or young obstetric physician—the varied experience of all, or of the best obstetricians, agrees that whether we have albumen in the urine or not, the careful, skilful administration of chloroform, even before adoption of the lancet, seldom fails to afford marked relief, and that in a majority of cases we may dispense with the excessive venesections of former times; chloroform in such cases, of course, is not to supersede other means usually had recourse to, such as delivery, &c.

In cases of severe agony, and jaundice attending the passage of *gall-stones*, the inhalation of a drachm or two of chloroform will often act like a sudden charm in affording relief from pain and spasm. It is probable here, that there is produced a relaxation of the ductus choledicus, and associated muscular or nervous fibres of the adjacent diaphragm, duodenum, abdominal muscles, &c., all thrown into spasm by an irritating calculus; it is curious, too, that jaundice has been occasionally produced by chloroform, especially when given in small or irritant doses; but this is a much more rare phenomenon than the cure of jaundice by it.

A case of the following kind has come under notice:—A gentleman in the higher circles of society, an old gentleman subject to bad attacks of jaundice and gall-stone, in the country, was supposed to be at the point of death from "black jaundice" and impacted gall-stones; an entire week of horrible agony had passed; warm baths, blisters, purgatives, globulistic remedies, ipecacuanha, and every other conceivable remedy had been tried in vain. Opium had made things worse, and emetics no better; a fair trial, in one word, was given, or supposed to be given, to the good old classic abracadabra of Copeland and Watson, that

> "Old Experience which doth attain
> To something of prophetic strain."

Experience of all kinds had been summoned from the nearest country town; but with amiable suavity, Old Experience had pronounced the case incurable; it had been well excogitated that the bile secreted by the hepatic cells had probably regurgitated along the cystic duct into the gall-bladder; there stored up it became concentrated; how cholesterine (not Dr. Thudicum's blood corpuscles) had formed a calculus, with much more, all pointing to sadly established organic disease of the worst kind. In this emergency, as a matter of "ridiculous form," as it was said by Old Experience, a young but eminent city physician was summoned by telegraph—a man of the new school, eclectic and sensible, who are glad to adopt remedies from whatever side of the compass they come.

"Have you tried chloroform," he ventured to ask in consultation? "Nothing like leather—of course not; but perhaps you would like to do so." To which he replied in the affirmative.

A few drops of chloroform, in fine, were tried, with the best possible result; the agony of the gall-stone yielded as if by some potent spell, the simple *rationale* of the cure being that it relaxed the muscular fibres, perhaps, of the pylorus and duodenum, the gall-ducts, diaphragm, &c., and allowed the gall-stone to pass, whereas previous purgatives, blisters, opium, &c., had only tended to derange the healthy sympathy which usually exists between the mucous membrane of the duodenum and the bile passages. In a sad case of this kind, not very long ago, it will be remembered, one of our most eminent members of Parliament died of the agony of gall-stones, and the derangement brought on by large doses of opium; it is probable one drachm of chloroform would have saved his life.

In some of the worst sufferings of uncomplicated asthma and in hooping-cough I have known the inhalation of chloroform to prove very beneficial; indeed it is clear that the often-vaunted popular cures of hooping cough, by children inhaling the vapour at gas works, is easily and only to be explained by the calming influence on the glottis of some of the many gaseous carbo-hydrogens belonging to coal-gas, so like chloroform. I have known also the popular specific, or liniment of oil of amber, camphor, &c., for hooping cough, to prove far more useful when chloroform and ether were added to the formula—the liniment rubbed to the chest and neck, rather than in the time-honoured method, to the spine of the child. If hooping cough (as it often is) happens to be mixed up with bronchitis, or if asthma be associated with emphysema, the chloroform will cause disappointment if it does not aggravate matters. A little antimony for the bronchitis may, however, be combined with the inhalation method, and will never disappoint in the bronchitis of children; the direct application of solution of nitrate of silver to the glottis, in hooping cough, is also facilitated by the use of chloroform.

Again, in various forms of epilepsy, though theory at first contraindicated the administration of anesthetics, subsequent experience has fully established the fact, that, contrary to presupposed views, chloroform in full doses controls the epileptic fit; and while good breathing is kept up there is no cause of apnea, or alarm from suffocation. It is however as an auxiliary—in allowing a full examination as to the peripheral origin of the epilepsy, and surgical interference, by caustic or knife, leading to the cure of hundreds of such cases—that chloroform has remodelled the entire practice of epileptic diseases; the mechanism of the epileptic fit has now been so well explained by Brown-Séquard, Reynolds, and others, and the fit itself so often found to depend on external or peripheral sources; for instance, irritation of bad teeth, worms, external excitement of the genito-urinary organs, that a trial of chloroform, especially in female epileptics, seldom fails to yield suggestive results. Chloroform, on the other hand, is of less value (if not attended with positive risk) in hysteria and chorea; it is also of questionable safety in the debility of delirium tremens and puerperal mania; but in the other affections detailed—convulsions, asthma, hooping cough, gall-stones, obstetric practice generally, and many other purely medical cases—it will seldom fail to give most beneficial results.

In these observations I have not dwelt on the use of chloroform, except by inhalation. Every one, however, now knows the great usefulness of "chlorodyne" in all the several varieties of which Roscoe and others have shown that chloroform is the active agent, though at first denied.

Art. V.—*Diphtheria; a Paper Read before the Medical Society of the College of Physicians, Ireland, March* 21, 1866. By Dr. Hayden, Physician to the Mater Misericordia Hospital.

Although the name diphtheria can, with strict propriety of language, be applied only to such cases as present, amongst other characteristic symptoms, that of pellicular exudation in the fauces or pharynx, still, cases are not unfrequently met with during an epidemic visitation of diphtheria, and even sporadically, which, presenting most of the usual features of genuine diphtheria, including vascular engorgement of the throat, the absence of false membrane would scarcely warrant us in excluding from a category the members of which we learn to recognize rather by generic than specific characters. The appearance of diphtheritic exudation being, moreover, usually, if not invariably preceded by certain general and local symptoms, the disease may not proceed beyond the first stage, in which the throat is simply inflamed, either because of the decline of the epidemic influence, or of the constitutional resistance of the patient, or, perhaps, of the early and successful application of remedies.

M. Empis says:—"From the circumstance that diphtherite is a phlegmasia, it should at first present the phenomena which are common to every inflammation; and this is, in fact, consistent with my observations, and all my cases testify to the truth of this view."

A few of the cases which I am about to adduce presented diphtheritic exudation in only minute patches, and in another there was no exudation on the occasion of my visit, although it ultimately proved fatal.

The following cases are reported by Dr. Moore, of Amiens-street, with whom I saw the patients:—

On Tuesday, 18th April, I was called to Clontarf, to see a child of Mrs. K's. Several cases of diphtheria having been reported in the neighbourhood, and one of her own children having died on the Saturday previous (15th April), she determined to take her three children to Dublin for some time. She left the country on Sunday evening; her eldest child, a girl of eight and a-half years, complained of headache, &c., on Monday evening, and I was requested to see her on the following day: she is a rather delicate child; when I saw her she was feverish, skin very hot, respiration easily performed, face flushed, could swallow very fairly.

On examining the fauces I found a patch of slough over the left tonsil, about the size of a shilling, raised, and pale yellowish in colour. I touched the surface of the slough with tincture of the sesquichloride of iron, and directed a mixture containing hyposulphite of soda and compound tincture of cinchona, and also a powder containing half a grain of James's powder and calomel, to be taken every third hour. I advised Mr. K. to remove the child into town, as being more convenient for treatment, and also to separate her from the other children in the same house. I saw the child a second time this day when removed into an hotel, and again applied tinct. of the sesquichloride of iron, and ordered nourishment: beef-tea, arrowroot, &c.

On the 19th I had the advice of Dr. Hayden, who continued daily to see the child with me; he directed the hyposulphite to be continued, but in less quantity; five-grain doses being now given every third hour in same vehicle as before. At his suggestion I now commenced to apply, thrice daily, to the slough, which had spread to both tonsils and uvula, a lotion containing chlorate of potash and tinct. of myrrh; a small blister was placed under each angle of the inferior maxilla.

20th.—She swallowed pretty well, and has had almost no difficulty in this respect; the blisters did well; continued the application to the throat; some griping and tenesmus produced by the hyposulphite; the same mixture continued, with the addition of ʒii. of syrup of white poppies.

21st.—A stimulating liniment to be applied over throat, sprinkled on lint, composed of tinct. cantharid, with compound spirit of lavender, and soap liniment; nourishment and other treatment to be continued; she sleeps fairly.

22nd.—Continue mixture, &c.; some tendency to diarrhea, for which were prescribed six grains of compound powder of chalk every third hour; sloughs are being detached; liquor of the pernitrate of iron ordered to be used should bleeding come on; the patches of ulceration look much smaller and more healthy to day.

23rd.—Continue treatment; give chicken jelly, &c.; has been taking wine for some days; pulse has been generally about 120.

24th.—Bowels not free; ordered aperient powder and oil draught.

25th.—Bowels free; ordered to take five-grain doses of hyposulphite of soda in half an ounce of infusion of cinchona every third hour; nourishment, &c.

27th.—Improving very much; ordered quinine, one-grain dose three times a day. On the morning of this day the youngest of the children, a boy about two and a-half years, was brought to me; he was feverish, face flushed, tonsil exhibited ulceration, but to a much less extent than in the girl; it did not spread so much. Dr. Hayden ordered her to have half a drachm of wine of ipecacuanha every fifteen minutes until emesis was produced; afterwards an aperient powder, and three-grain doses of hyposulphite of soda in half an ounce of infusion of cinchona every third hour; the same form of application to tonsil, and nourishment.

28th.—Both children doing well.

29th.—Youngest to have small blister under angle of jaw.

30th.—Youngest directed to continue hyposulphite of soda.

May 1st.—A blister over tonsil; same treatment as before.

May 3rd.—Slight diarrhea — arrested by five-grain doses of compound powder of chalk; from this date until the 8th improvement in both children.

I have seen the eldest some time since in good health; the uvula, which was partially destroyed by slough, is shorter than natural.

M. L., a pawnbroker's assistant, aged 30, who had been repeatedly, during the last two years, under my care for various ailments, chiefly of a nervous character, consulted me about 6th of November, 1865, chiefly in reference to severe night sweats and great debility; his pulse was weak and rapid, tongue foul, there was general palor, loss of appetite and sleep, and rather troublesome cough, with mucous expectoration. On careful examination of the chest, the only physical evidence discovered, calculated to warrant the apprehension of tubercular deposition in the lungs, was a loud soft systolic murmur, heard beneath the left clavicle at the end of inspiration, and manifestly having its seat in the subclavian artery; percussion was everywhere normal, as were likewise the heart's action and sounds.

As the patient had been much confined in a close ill-ventilated shop, and was of strumous appearance, I confess that in the absence of any other rational explanation of the severity of his night sweats, which were such as to saturate two shirts each night, coming on only towards morning, and after he went to sleep, and of his remarkable debility after an illness of only three week's duration, I was disposed to regard the case as one of acute phthisis, with incipient but rapid tuberculization of the left lung; the murmur in the left subclavian artery being due to the presence of the tuberculized apex of the corresponding lung upon that vessel at the acme of inspiration.

The treatment consisted in the application of a small blister under the left clavicle, with some expectorant and astringent medicine.

The patient visited me again in the course of a few days, not at all improved either in his general condition or as regarded his urgent symptoms.

I now directed a change of residence, and prescribed small doses of cod-liver oil, with syrup of the iodide of iron, and continued to visit the patient at his lodgings; no improvement, however, took place; the night sweats continued, rendering necessary a change of linen twice in the course of each night, and debility increased; whilst, at my morning visit, the pulse was rarely above 96, and the subclavian murmur had latterly vanished. I felt greatly puzzled, and considered whether the case might not be one of irregular intermittent fever, due to bad ventilation and drainage, both of which conditions were present where the patient was in the habit of sleeping when at home; two-grain doses of quinine were accordingly prescribed, but with no better result than before: the perspirations were, however, checked by sponging the body over with tepid vinegar and water. Up to this time (Nov. 18) the patient complained of no soreness of the throat, no difficulty in swallowing; this morning, however, he "hawked" up rather significantly, and complained of slight uneasiness under the left angle of the inferior maxilla.

On examining his throat I found the entire soft palate of a deep dark red colour, dotted over with patches of dirty looking fawn-coloured pellicle; the left tonsil was similarly, but more extensively covered, and the isthmus and back of the pharynx were occupied by strings and bands of viscid mucus.

The nature of the case was now no longer doubtful; it was an example of diphtheria, of a novel and anomalous character; novel in its positive and negative symptoms, viz., in the presence of profuse colliquative night sweats, with intervals of all but complete apyrexia, in the absence of the characteristic sore throat, until five weeks after the date of first illness. A more minute inquiry now revealed the fact that the patient had been visiting a fellow assistant in the establishment, who had been lying ill of "fever" of some kind, in one of the upper apartments of the house, and that about that time he felt a chill after returning home from business, late one evening; he slept indifferently that night, and was sick, unable to take food, and generally unwell next morning; in the course of a few days perspiration set in; he continued at business, though scarcely able to stand, for three weeks after this date, and up to the time of his first visit to me. I directed an eight-ounce mixture containing three drachms of hyposulphite of soda, with syrup of poppies and compound tincture of cardamoms, of which he was to take a tablespoonful every third hour, and also ordered a gargle of biborate of soda and chlorate of potash; six ounces of wine in the course of the day, beef-tea with bread-crumb, *ad libitum.*

November 20th.—Generally improved; sweats less.

November 25th.—Patient much improved as regards appetite, sleep, and strength; sweating still continues, but in less quantity; throat quite well. About this time I recommended the patient to go to the country for change of air, and lost sight of him.

John J. T., aged 35, was admitted into hospital January 28th, 1865. Had been a clerk in a close office, and lived in a dark ill-ventilated room. Had diphtheria six weeks ago, for which he was treated in another hospital. Throat and fauces dry, red, and granular-looking, with a few white dots dispersed at intervals; patient is only half conscious, and is profoundly deaf; was slightly deaf before present illness; is remarkably irritable; pulse regular.

February 2nd.—Pulse 60, and weak; every third or fourth beat of heart, as likewise of radial pulse, is lost; no cardiac murmur, or derangement of respiration. To have five-grain doses of chlorate of potash with chloric ether, in infusion of cinchona, three times a day; a gargle containing tinct. of myrrh; nourishing diet, and wine.

February 3rd.—Intermission of heart and pulse about once in 60 beats; pulse 90, and of better volume; first sound of heart dull and somewhat muffled. To have one pint of porter and eight ounces of wine daily.

February 4th.—Pulse 42; every second beat lost, as likewise of heart. Ordered eleven grains of hyposulphite of soda, with compound tinct. of cardamoms, three times a day.

February 7th.—Intermission of heart irregular; action of heart and pulse exceedingly weak; pulse 42; tongue moist, and aspect of patient manifestly improved.

February 8th.—Pulse rather stronger, and intermitting regularly; *i.e.*, once in fifteen beats, the rate being 84 in the minute, whilst in the succeeding minute every alternate beat was lost *four times in succession*—the rate being also slower, so that there were only 48 beats in the minute; patient generally improved; tongue moist and clean; appetite good; allowed to get out of bed to-day at his own request, as bed-sores were threatened.

February 19th.—Deafness much improved; tongue clean, and pulse no longer intermitting; appetite good; a small abscess formed in the right external auditory meatus. Diarrhea, which is attributed to hyposulphite—latter consequently stopped, and small doses of Dover's powder given. From this date till the 1st of March, when the patient was discharged from hospital perfectly well, the progress towards recovery was uninterupted.

Of the two following cases my notes are very meagre, as the patients were seen in the dispensary, and I had time only to record a few particulars respecting them.

William W., aged fourteen, felt ill on the 5th of May. I saw him on the 8th, when the throat was inflamed, and covered with patches of false membrane; ordered hyposulphite of soda in five-grain doses, three times a day. Seen again on the 10th, and also on the 15th, when he was dismissed as cured.

James W., aged sixteen, brother to the last patient, was taken ill on the 16th May. I saw him on the 17th, when the pharynx was red, and both tonsils were covered with pellicular exudation; ordered hyposulphite of soda in six-grain doses thrice daily. I lost sight of this patient, and therefore cannot speak positively as to the result of treatment, but as there was no further report of him I presume his case went on favourably.

Mr. M., aged seventy, residing in a well-ventilated house, on an elevated site, complained of a sensation of chill, with debility and soreness of throat, towards the end of last January. I saw him, with Mr. M'Crea, of Clondalkin, on the 4th February: the fauces and pharynx were then of a deep-crimson colour, without exudation; there was engorgement of the bases of both lungs, and slight cough; pulse quick and weak; tongue dry, and surface cool. The treatment consisted in sulphate of quinine, brandy, strong broths, and a gargle containing tincture of myrrh. In this case, owing to irritability of stomach, and the absence of exudation in the pharynx, no specific treatment was instituted. In a letter which I received from Dr. M'Crea, on the 15th of March, he says—"His throat continued a long time relaxed, but slowly improved as his general health got better; he got on so well for a full fortnight as to take broths, and wine, and a chop every day; he was able to sit up the greater part of each day, until he unfortunately went down stairs and caught cold; got a fresh attack of his former symptoms, and sank very rapidly, though plenty of nutriment and stimulants was given."

James K., aged forty, porter, admitted into hospital January 15th, 1866; complained a few days previously of headache, shivering, sickness of stomach, and pricking of throat; pulse quick and weak; throat dark red, with minute patches of false membrane of a dusky-yellow colour dispersed over the tonsils and palate; there is loss of appetite and somnolence; to have ten-grain doses of hyposulphite of soda, with syrup of poppies, in camphor mixture, every third hour; a gargle composed of chlorate of potash and tincture of myrrh; six ounces of wine daily, and beef-tea.

On the following day this patient was attacked with erysipelas of the right side of the head and face, which was treated locally with sulphate of iron in the form of ointment; he was altogether thirteen days in hospital, during which there was no alteration in the treatment, except in the substitution of quinine for the hyposulphite, a few days before the patient left hospital; he was discharged on the 28th January, quite restored to health. The occurrence of erysipelas in this case is noteworthy; Dr. Greenhow remarks:—"Erysipelas has very often coincided in prevalence with diphtheria."

As my object in bringing forward these cases was only to illustrate the remedial action of the hyposulphites, in the hope that others may give these agents a more extended trial in the treatment of diphtheria, I will discuss the general pathology of the disease only so far as it seems necessary, in order to justify what may be called specific treatment. Dr. Jenner declares that "diphtheria is a general disease—runs a quick and definite course, and has a specific cause." In this opinion I entirely concur; and, indeed, it will be difficult to controvert it, if due weight be given to the epidemic character of diphtheria—the great debility which accompanies, and frequently succeeds it—the frequent occurrence of albuminuria, and of specific exudation upon abraded surfaces, and lastly, the remarkable lesions of motion and sensation which are occasionally met with amongst the sequelæ of the disease.

If diphtheria, then, be a general disease, manifesting itself by consitutional as well as by local symptoms, it follows that general treatment is indicated; and further, if we admit that it is a specific disease, we are, as it seems to me, warranted in searching for a specific remedy. The remarkable experiments of Dr. Polli, of Milan, who has succeeded in arresting putrefactive fermentation by means of the hyposulphites of the earths and alkalies, encourage the hope that zymotic or catalytic diseases may be controlled by the same agents administered medicinally. It is true that both Bretonneau and Trousseau declare they have no confidence in the general treatment of diphtheria; but medicine is a progressive science, and we should not regard as final the adjudication of even the most eminent of our brethren upon a question still open to investigation.

In *The Dublin Quarterly Journal of Medicine* for August, 1864, Dr. De Ricci has published some cases of septicemia successfully treated with bisulphite of soda. Encouraged by these results, as well as by several cases of diphtheria which recoverd under the hyposulphite treatment, reported from time to time in the journals, I determined to give these agents a trial; and although some of my cases were examples of the milder form of the disease, or the "common membranous angina" of Bretonneau, others, as Cases I., II., and IV., were sufficiently serious to warrant an unfavourable prognosis. Death occurred only in one instance amongst the eight cases; in that instance alone the hyposulphite was not given; the patient was seventy years of age, and his case was complicated with congestion of both lungs.

I do not mean to assert that in the hyposulphites we have got an agent capable of neutralizing or decomposing the toxemic principle of diphtheria, whatever that may be; but of their curative properties in this disease I think we have sufficient evidence to warrant us in giving them a more extended trial. The only inconvenience which I have experienced in the use of the hyposulphite of soda was the occasional occurrence of diarrhea, but this was readily corrected by the addition of a little syrup of poppies, or other mild astringent.

Art. VI.—*Reports of Hospital Cases:—Strangulated Inguinal Hernia.* By William MacCormac, M.A., M.D., Q.U.I., F.R.C.S.I.; Surgeon, Belfast General Hospital.

Upon such a subject as hernia it would, perhaps, be difficult to bring forward anything very novel, yet so various and so unexpected are the peculiarities occasionally presented, that an account of the four following cases will not, I should hope, prove uninteresting. All four were examples of oblique inguinal hernia; two being of the kind termed congenital, and two of ordinary inguino-scrotal hernia. These cases serve to illustrate the diversity which even one species of rupture may present; a circumstance which calls forth the resources of the surgeon, and gives practical interest to the faithful record of almost every case of this always dangerous, and not very infrequently fatal, disease.

Inguinal hernia we know to be the commonest form of rupture. About one-half the cases of strangulated hernia are of this kind; but of these, according to Mr. Bryant's statistics, one only in three requires herniotomy, the other two being reducible by the taxis. In all the four cases, the particulars of which I am about to relate, the taxis proved unsuccessful, and an operation was found necessary.

The skill of the surgeon requires mainly to be directed to solving the difficult problem as to the precise time when operative interference becomes imperative, and milder measures should be abandoned. When that decision has been arrived at, the more promptly it is carried into execution, both for preservation of life and the credit of surgery, the better. Vidal, in his great surgical work, puts this matter very forcibly, as in the following words:—"Je ne crains pas de le dire, c'est aux temporisations, et aux manœuvres trop répétées du taxis, qu'on doit rapporter les neuf dixièmes des insuccès de la kélotomie." And our own Mr. Hey tells us:—"He had often occasion to lament that he had performed the operation too late, but never that he had performed it too soon." Indeed, all modern experience proves to us with what impunity the peritoneal cavity may be opened. It is not, I believe, wounding the peritonal sac which we need so much dread as the devitalizing effects of long-continued strangulation of its contents; and, of course, the longer this condition is permitted to subsist the greater the fatality after operation must prove.

Of all the auxiliary means employed to reduce strangulated inguinal hernia chloroform is admittedly the most valuable, and the question arises whether it might not be desirable to use it primarily in all cases. Mr. Bryant is very strongly in favour of our doing so; and he states, in support of his opinion, that amongst seventy-eight instances of reduction by the taxis of strangulated inguinal hernia, he found fifteen, or nearly twenty, per cent. were completed under the influence of chloroform, and that in nearly all these instances all other means had been attempted, and had failed; reduction being effected by the surgeon who had been summoned to operate. It appeared to him to be only a natural and fair conclusion that we should primarily employ the means which have been proved so successful, and not waste time by the employment of other remedies when we possess one so incomparably superior. It was not possible to carry out this plan in treating all the following cases, but I am sure it would be the best rule to adopt in treating the very acute forms of this disease.

I now propose briefly to describe the examples of strangulated hernia which form the subject of this communication, and to point out what appears to me chiefly interesting in each:—

The first case was that of a man twenty-seven years of age, a chain-maker by trade. He was admitted to the Belfast hospital between twelve and one o'clock on the morning of the 6th November, 1864, suffering from a strangulated inguinal hernia. He stated that he had been subject to rupture on the right side since childhood, but only wore a truss for the last two years. The instrument had lately been broken, and failing to get it replaced, the gut was continually coming down; and he often found great difficulty in replacing it. Last night, the 5th, at half-past seven o'clock, the hernial protrusion suddenly made its appearance, apparently after no unusual effort. Being quite unable to reduce the swelling, and getting alarmed at the pain and sickness he began to experience, he obtained admission into hospital.

On examining the patient, about five hours after the accident, I found the right side of the scrotum distended by a very large tense and elastic tumour, cylindrical in form, with rounded ends. The swelling measured fully ten inches in length, and fifteen inches in circumference, as nearly as could be calculated. The penis was invisible. The testicle could be felt at the lower and back part of the tumour, gliding freely over its surface, and evidently contained in a distinct sac. Hardly any impulse could be detected upon coughing. Twice, before admission, the patient had vomited bilious matter, and he now complained of great nausea and depression, and pain in the pit of the stomach. There was very little local tenderness or pain complained of. I diagnosed a hernia into the vaginal process of peritoneum, with the testicle shut off in its own proper tunic. The name given by Mr. Birkett to this form of congenital hernia, which was first recognized by Malgaigne, is hernia into the funicular portion of the vaginal process of peritoneum, which describes more correctly than any of the other terms employed the particular form which the disease assumes in these cases. My principal reason for supposing the hernia to be of this form was its existence from childhood, from a date long anterior to the patient's recollection; for, as Pott observes, the appearence of a hernia in very early infancy will always make it probable that it is congenital. This variety is now known to be of nearly as frequent occurrence as the ordinary congenital hernia described by Haller. Immediately after seeing the patient I gave him a dose of opium, and had him placed in a warm bath. On trying the taxis in the bath I was able in a very short time to reduce the tumour to two-thirds its former size, and I expected that in a short time the entire protrusion would disappear within the abdomen. I was disappointed, however, for no efforts on my part made any further change in the bulk of the swelling. The patient was, nevertheless, much relieved, and I felt justified in postponing any further attempt at reduction until morning. I requested my colleagues to meet me at 10 a.m. At that hour, on visiting the patient, I found that he had slept well. He complained of very little pain or uneasiness. The pulse was 60, and there seemed to be no urgent symptoms. After the consultation, at the instance of one of my colleagues who was present, I ordered the application of ice bags to the part, and the administration of a fetid enema. My own inclination was, however, immediately to attempt reduction, under chloroform; should it fail, to operate.

The following day I found that the man had spent a restless night, and had vomited several times. He now complained of constant nausea, and severe pain in the neck of the tumour, on which the remedies employed seemed to have produced no effect. The taxis, conjoined with the trial of the other means before-mentioned, having failed to effect more than a partial reduction of the tumour, herniotomy seemed the only alternative left, should the taxis, under chloroform, fail. In this view my colleague, Dr. Murney, fully concurred. The man was, therefore, anesthetized, and the taxis tried, both by Dr. Murney and myself. It failed to produce any further diminution in the bulk of the swelling. Accordingly, I proceeded to make an incision, three inches in length, in the axis of the tumour, from a point over the internal ring, downwards to the scrotum. The different layers of fascia were carefully divided upon a director, and the sac exposed. Across it, at the region of the external ring, stretched two or three fibrous bands. These were, one after the other, divided, but the hernia still remained irreducible. On a search been made for the cause, a thick fibrous band was found incorporated, apparently, with the neck of the sac. This was most cautiously divided; and, in so doing, the sac, of which it seemed to form an integral part, was opened. A quantity of dark red serum spouted out a yard from the operating table, giving those present the impression that a hydrocele was being operated upon in mistake for a hernia. The quantity of fluid was enormous, amounting, according to our estimate, to between thirty and forty ounces. Projecting from the inguinal canal were now seen a knuckle of small intestine, dark red in colour, and much congested, and a small piece of omentum. That the stricture was a very tight one was proved by the condition of the intestine, and from the fact that the fluid in the hernial sac could not be forced through it. No difficulty was now experienced in reducing the the protrusion. After it had been returned a large additional portion of fluid flowed away from the peritoneal cavity. Four sutures were inserted into the wound, and water dressing was applied. The after progress of the case was uniformly good. The pulse never rose above sixty-four. On the sixth day after the operation the bowels were opened naturally, and on December 12th, rather more than one month after, the report was as follows:—"The wound is now completely healed, and the patient is walking about the ward." He was discharged soon afterwards, wearing a double truss, which was rendered necessary by the weakness of the abdominal wall on the left side. The side operated upon appeared much the stronger of the two.

This case was unusual, both on account of the large size of the tumour and the nature of its contents. It might have been mistaken for hydrocele, as the swelling had quite the same rounded form; the impulse on coughing was not at all well marked, and the neck of the sac was comparatively small. The history and the symptoms of the case, however, precluded this idea. Another feature of interest in the case was the partial reduction of the swelling, and the subsequent impossibility, by any of the means employed, of making a further diminution in its size. In congenital hernia, reduction by the taxis is always difficult, since the inguinal canal is unshortened, and the stricture is generally tighter, and symptoms of strangulation occur earlier and more severely than in the acquired form of hernia. Although no untoward result followed, it is to me a matter of regret that the operation in this case was not earlier performed. It is, indeed, unfortunate when any unnecessary delay takes place, after a distinct failure to return the protrusion by some of the ordinary methods, as the possible advantages cannot, I believe, countervail the certain disadvantages which such a line of practice is calculated to entail.

The second case was that of a telegraph clerk, twenty-two years of age, a person of considerable intelligence. He was admitted to hospital on the 26th May, 1865, at ten o'clock in the evening, with a swelling in the right side of the scrotum, which had been ascribed to an enlarged testicle by his medical attendant. The true nature of the case was not recognized upon admission. It was supposed to be orchitis. I was not sent for; and until my ordinary visiting hour, ten next morning, I did not see the patient.

The history of the case is as follows:—The man stated that for a longer period than he could recollect—he believes from infancy—he had been subject to the frequent appearance of a swelling in the scrotum. The first occasion on which he remembers noticing it was when a boy of ten, while playing at ball, a large tumour suddenly appeared in the scrotum. On assuming the horizontal posture it vanished. The patient all the time, however, believed it was his testicle which was affected. He is intelligent, and appeared to know quite well what was meant by a rupture, but felt positive that he never had had anything of the sort. He had never worn a truss. Three weeks since the swelling suddenly showed itself in the scrotum, and he found himself unable, as before, to cause it to disappear. Believing the testicle had become inflamed he took some purgative pills and a seidlitz powder. Finding himself getting worse, and suffering from sickness, prostration, and hiccough, he obtained admission, on the 5th May, to a county infirmary. There, the patient's own statement as to the nature of his disease, was apparently adopted as the correct one—if the treatment he received is to be considered any criterion. Six leeches were applied to the part, and hot stupes; some pills were also given to purge him, followed in the morning by a black draught. On the fourth day after his admission the swelling, he states, suddenly and spontaneously disappeared; the bowels were then acted upon for the first time; and he left the infirmary. Meanwhile he had suffered much from sickness and prostration, and had, moreover, been seized with hiccough.

The next appearance of the tumour was at noon on the day of his admission to the Belfast Hospital. Almost immediately afterwards he felt intensely sick, with a sensation of extreme prostration. He now sought further assistance, and a medical man applied a few leeches, and recommended him to go to hospital.

On the morning of the 27th, when I first saw the case, I found the right side of the scrotum distended by a tense globular tumour, as large as an orange, not tender on pressure, except at its neck. It could be traced up into the inguinal canal, which seemed slightly swollen. The testicle was undistinguishable; but the cord was to be felt running along the back of the swelling. Not the smallest impulse could be detected upon making the patient cough. The leeches applied before admission had caused free bleeding, which continued most of the night. He had not slept any in spite of a large opiate which had been given after admission. During the night, also, he had vomited a great deal; was suffering from constant nausea, and from great pain in the belly, which was tympanitic.

From the previous history and the present condition of the patient, although he quite repudiates the idea of having a rupture, I concluded that I had to deal with a case of strangulated congenital hernia, with probably a tense stricture demanding immediate relief. I decided that the best course would be to try the taxis, under chloroform, as soon as possible, and should moderate efforts then fail, to operate forthwith. As the case was by no means free from obscurity, I requested my colleagues to meet me in consultation, in one hour's time, and directed that the patient should, meanwhile, be kept in a warm bath.

After the interval just mentioned had elapsed, the patient, well wrapped up, was removed to the operating theatre. My colleague, Dr. Murney, the only one able to attend, agreed thoroughly with me in my view of this somewhat difficult case. Chloroform was administered, and the taxis was then tried. The stricture, however, seemed so tight, and the parts involved so tense and unyielding, that the attempt had speedily to be abandoned, and before the patient had recovered from the influence of the anesthetic I proceeded to perform the operation. The intestine had now been prolapsed for twenty-six hours, and might be considered to have been strangulated almost from the very first.

I made an incision some three inches in length in the usual situation, carefully divided several layers of fascia, and exposed the hernial sac. This was now opened at the inferior part of the wound, as there appeared to be no prospect of reducing the hernia without doing so. About an ounce of light-coloured serum escaped; and between seven and eight inches of much congested small intestine were exposed. There was no omentum. Passing the forefinger into the neck of the sack a constriction was detected at the external ring, and divided. I now tried gently to pull down the intestine previous to returning it. I found it was quite immovable, even when firm traction was resorted to. I then re-introduced my finger, and after passing it up the full length of the inguinal canal, which was dilated, and apparently unshortened, I reached with some difficulty, a second stricture at the internal ring. Through this, after considerable manipulation, I insinuated the tip of my finger, and found a stricture so tight that it felt just as if a piece of cord had been tied tightly around it. At such a depth from the surface, fully two inches and a-half, it was at once difficult and dangerous to attempt to divide the constricting ring. I did so, however, by passing a straight blunt pointed bistoury flatwise along the front of the finger, by which the edge was guarded, until the end had got beneath the ring. I then turned the edge directly upwards, and freed the constriction. I certainly could not have performed this part of the operation with either ease or security had I used any of the different forms of directors, or a curved knife, in place of a straight-bladed one.

The bowel was now easily drawn down, and the portion included in the stricture was, I observed, deeply sulcated. During the return of the intestine I saw the testicle lying exposed at the bottom of the scrotum, and contained in the hernial sac, thereby establishing the correctness of the diagnosis.

The evening of the operation I found my patient much easier. He was still inclined to vomit; and the abdomen, on examination, was found painful and tympanitic. Calomel and opium, and a fetid enema were ordered. Next day a new and very unusual symptom declared itself. The right testicle had become enlarged and exquisitely tender; and I subsequently ascertained that suppuration of the hernial sac had also taken place. On the seventh day after the operation I found it necessary to lay open the cavity of the tunica vaginalis, by extending downwards the original wound, and so give issue to four ounces of laudable pus. When this complication had been overcome the case proceeded satisfactorily enough.

The wound rapidly closed, and the testicle, which had been much enlarged, returned to its normal size. On the fourteenth day after the operation the patient was able to sit up, and was pronounced convalescent. Soon afterwards he left the hospital with his general health in every way improved. The local disease was cured; for, in consequence of the inflammatory action set up in the parts the inguinal canal had become blocked up or obliterated. There was no tendency to protrusion when he was discharged; and some months afterwards I had an opportunity of ascertaining that he did not require to wear a truss. A radical cure, in short, had been effected.

"Nothing," says Sir Astley Cooper, "but great want of attention can cause a hernia to be mistaken for an enlargement of the testis." Yet in this case that mistake, I believe, had occurred in three different instances. The patient's own statement that he had no rupture seems to have been adopted without dispute, and he was treated by purgatives and leeching, just as if the disease had been orchitis. The diagnosis of the case was certainly not altogether free from difficulty; for, in addition to the patient's own assertions that he never had had rupture, the absence of all impulse on coughing, and the comparatively small diameter of the neck of the sac involved some doubt. On the other hand, the history and the symptoms clearly showed the case to be one of hernia proper, and not hernia humoralis, or hydrocele.

This, like the majority of congenital herniæ, required the opening of the sac; and the circumstances here detailed show the necessity of the procedure. The contents of the sac were those most frequently found—omentum being rarely present in hernia into the vaginal process of peritoneum.

The importance of recognizing this form of rupture in the adult is very great. It was pointed out by Dupuytren, and subsequently by other observers, how frequently congenital herniæ were strictured at the internal ring, that the course run by such cases was very acute, and that, in consequence, relief must be promptly afforded. They occur, indeed, more frequently than is commonly supposed; and, as in the two cases here described, are generally found upon the right side. In the majority of instances some portion of the vaginal process remains open for some time after birth; and it is found longer unclosed upon the right than upon the left side.

My third case was that of a man sixty-four years of age, one who had been a domestic servant, then for many years a soldier, and who is now a day labourer. He was admitted into hospital at

2 p.m., on the 31st January, 1866, with a strangulated inguinal hernia on the left side. He stated that he had been subject to rupture for thirty years. It first appeared as a small tumour in the groin, but afterwards gradually formed a large swelling in the scrotum. For many years he kept the protrusion up by means of a truss. This had recently been broken, and the imperfect contrivance of his own with which he replaced it, permitted the frequent descent of the bowel. On the day before his admission to hospital, at 10 a.m., the swelling formed in the scrotum, and he found himself unable to return it as usual. Very soon he began to vomit, and to suffer great pain both in the part itself and over the abdomen. Two medical men who saw him tried the taxis four times that evening, and once the next morning, without success. The symptoms increasing in severity, they recommended his admission into hospital. When I saw him, shortly afterwards, I found the left side of the scrotum distended by a tumour as large as a cocoa nut, measuring, indeed, nearly eight inches in length, by three and a-half inches in diameter. The neck of the tumour was thick, and the lower part of the inguinal canal was much distended. The spermatic cord could be traced running up the posterior surface of the protrusion, and the testicle indistinctly felt at its lower part. The swelling had the unusual hour-glass form, caused by a well marked constriction just below the external ring. Above this the inguinal canal was partially dilated by a globular tumour, much smaller than the tumour below the partial septum. Scarcely any impulse was communicated to the part when the patient was told to cough. He felt very sick, and complained of severe pain in the left inguinal region, which was extremely tender when pressure was made over the neck of the sac.

I directed the patient to receive a full dose of opium, and to be placed in a warm bath. While he was in the bath I tried the taxis for a short time without effect. The intestine had now been strangulated for twenty-six hours; and in order that no further time might be lost the patient was brought under the influence of chloroform about two hours after his admission. Very gentle efforts were made to reduce the tumour, but without effect, and my colleagues, then present, agreeing with me that relief should be given, the operation was at once commenced.

An incision, commencing over the internal ring, was made for four inches downwards towards the scrotum; the subjacent layers of fascia were carefully divided, and the sac was exposed; across it ran a tense fibrous band corresponding to the hour-glass-contraction; this band was incorporated with the tissue of the sac, which was necessarily opened when dividing it; a little dark-red serum escaped, and some omentum protruded from the wound. I now tried to effect reduction, but failed; and on introducing the finger a little way easily discovered a second stricture at the internal ring, which was cautiously divided; the edge of the knife being merely pressed against the tense fibres of the ring, which readily gave way before it; the forefinger of the left hand was here also used as a director, which gives both confidence to the operator, and directs with certainty the motions of his knife; the omentum was now returned, and then the small intestine which came into view; the first portion of the intestine was but little congested, but the latter portion, which lay in the inferior division of the sac, and had been acted upon by both strictures, was purple-red; upwards of three feet of the small intestine were replaced, inch by inch, in the abdomen before the sac was emptied; five points of interrupted suture were inserted in the wound, and the usual dressings were applied.

During the evening and night of the day after the operation the bowels acted three times very freely, and this in spite of the opium taken to prevent it; and throughout the entire convalescence the tendency to diarrhea could only partially be kept in check; no other complication occurred during the after-treatment, save that the left testicle became slightly enlarged; the wound slowly healed, and was all but closed upon the twentieth day after the operation; the patient was then able to sit up, and is reported as being quite convalescent. He was discharged from hospital a few days afterwards, and recommended to wear a light truss.

This case, whose history is distinctly that of the ordinary inguino-scrotal variety of hernia, is unusual on account of the hour-glass-contraction at the upper part of the sac. This peculiarity, Mr. Birkett alleges, is always associated with a congenitally open condition of the vaginal process of peritoneum. The great length of intestine, contained in this hernia, added very much to the danger attendant upon an operation; besides, the repeated trials of the taxis, and the diarrhea which subsequently manifested itself, were most unfavourable features in the case. "Les selles promptes apres l'operation," says Vidal, "sont d'un mauvais augure." Notwithstanding this—and the man's previous habits, which had been much the reverse of temperate—the convalescence was not tedious.

The fourth case was that of an old man, eighty years of age;

he had been employed nearly his entire life either in whiskey-making or in whiskey-selling; he was for many years employed in the Belfast Distillery, and for upwards of thirty had kept a public house; when a young man he used to drink enormous quantities of whiskey—often as much as a quart, he said, fresh from the still, where the spirit is about sixty-five degrees over proof; he did not, however, consider himself a "great drinker;" until his present illness he had never, he said, been in the doctor's hands. He was admitted to hospital, with strangulated inguinal hernia of the left side, on April 7th, 1866, at half-past eleven at night. About four years ago he discovered that he laboured under rupture of the right side, and about two years later he found that a rupture had taken place in the left groin, the one that had become strangulated. The history he gave of himself was that, while in bed, between four and five, a.m., on the day of his admission, the gut on the left side protruded, and he was unable to return it; within half an hour sickness and vomiting, with severe abdominal pains, set in, followed soon after by hiccough; all day he expected the tumour would go up again, and took, for the purpose of aiding its return, senna and salts, and two purgative pills, which, fortunately, he threw off; as evening came on the pain grew more severe, and the prostration, sickness, and vomiting became worse, while the stomach ceased even to retain cold water. Dr. Harkin, who was called in at ten p.m., now requested me to visit him; and, as I found there was neither comfort or convenience where the poor old man lived, I merely ascertained the nature of the case, and had him removed to hospital; on examining him there I found a small reducible hernia in the right inguinal region, while in the left there was a tumour in the groin, situated above Poupart's ligament—very tense, hard, and sensitive; the abdomen was tympanitic, and the pulse very weak; he complained of great pain in the scrobiculus cordis; was much depressed, and believed himself about to die; nothing was retained upon the stomach, and the constant hiccough was very distressing. His case, considering his advanced age, the urgent nature of the symptoms, and the rapidity with which they supervened upon the descent of the hernia, was not a very hopeful one. The tumour more resembled a tightly strangulated femoral hernia than an inguinal one, which, however, it distinctly was. The man's condition admitted of no delay; he was at once placed in a warm bath, where, for a short time, I vainly tried the taxis; in the operating theatre, to which he was soon afterwards removed, I made another attempt to reduce the hernia while the patient was under the influence of chloroform; this trial merely confirmed my previous impression that a very tight stricture, which the taxis was not likely to overcome, existed; accordingly I determined at once to perform herniotomy. An incision through the skin and superficial fascia was first made commencing over the internal ring, and extending for three inches downwards towards the scrotum in the axis of the inguinal canal; three different layers of fascia were divided, and a thickened sac, with some bands constricting it in the region of the external ring, was exposed; these bands were divided in the hopes of returning the protrusion without opening the sac, but as the stricture was evidently seated elsewhere, it was necessary to open the sac, which I did at the lowest part of the wound; and in doing so, so tense was it, I experienced the greatest difficulty in pinching it up between the blades of the forceps previous to incising it; about an ounce and a half of reddish serum escaped, and a single knuckle of small intestine was found to be the only protruded portion of the abdominal contents; the gut was greatly congested, and so sharply folded upon itself that one portion of its concave border, about the size of a sixpenny piece, was chocolate-brown in colour, and seemingly in a state not far removed from becoming gangrenous. On introducing the finger a very tight stricture was felt at the internal ring; I freed this to, what I considered, a sufficient extent, with the knife guarded, as before, but could not return the protrusion; I, therefore, reintroduced the bistoury, and made a second incision in the stricture, being afraid of the results which might follow any rough or protracted handling of the bowel; still, notwithstanding the second incision, I found myself unable to reduce the hernia; and it was not, strange to say, till I had a third time cut through the tense fibres of the ring that I was able, without using violence, to replace the intestine within the abdomen; four sutures were now introduced, and water dressings, and a bandage were applied; the patient, who was in an extremely low state from the combined effects of the disease and the operation, was cautiously removed to bed, and a glass of brandy and water, with thirty minims of laudanum in it, was administered to him.

On seeing the patient next morning, about nine hours after the operation, he told me he felt himself "quite a new man." The pain and sickness, and other symptoms, had almost completely subsided; he was ordered nutritious diet, and a glass of whiskey daily. On the fourth day the report states that he had slept the entire of the previous night, and that the wound had almost completely healed by the first intention, save at the centre, from which there was a small oozing of pus. On the eighth day the bowels were open—naturally; and on the twelfth day after the operation the report is:—" The wound is completely healed, the bowels are acting daily, and the patient's general health is greatly improved." In short, he was perfectly convalescent; and left hospital, wearing a light truss, soon after.

The case just related is, in several respects, remarkable, especially when we consider the patient's very advanced age. Other surgeons may have had occasion to operate on persons as old, or even older; but similar occurrences must be rare. Mr. South, of St. Thomas' Hospital, had a case under his care in which a successful result followed an operation for inguinal hernia in a man eighty-two years of age. Independently of my patient being ten years beyond the prescribed limit of life, his previous habits had not been of a nature much to conduce to a satisfactory termination of so grave an operation; he had, in fact, been very intemperate; and, latterly, lived in extreme poverty. It is very unusual to find in one whose tissues must necessarily be relaxed by great age a hernia become strangulated with such great rapidity and severity; and it justified the inference, afterwards borne out during the operation, that the stricture was a tight one, as it proved necessary to use the knife to free it, three different times, before the rupture could be reduced. To the circumstance that no time was lost in giving relief after assistance had been called in, and to the fact that the taxis was very sparingly employed, I ascribe, in a great measure, the very successful issue. No efforts at taxis, indeed, however well directed, would have forced the intestine through the stricture; and such efforts would, in all probability, have resulted in irreparable damage to the highly-congested gut. The operation was performed about an hour after the patient's admission to hospital, and about twenty hours after the first descent of the bowel. Three-fourths of the wound, which, as before stated, had healed completely on the twelfth day, were as perfect an example of immediate union as could be desired. This is a rare mode of union under any circumstances, but especially so taking into account the age, and other antecedents of the patient.

I would only say, in conclusion, that in none of these four cases was the opening of the hernial sac attended or followed by any of those serious consequences which some surgeons think there is so much reason to dread.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Clinical Notes on Uterine Surgery, with Special Reference to the Management of the Sterile Condition. By J. MARION SIMS, A.B., M.D.; late Surgeon to the Woman's Hospital, New York, &c., &c. London: Hardwicke.

THE author of this book describes it as a collection of clinical notes, laying no claim whatever to the character of a systematic work " It is simply a voice from the Woman's Hospital which in all probability would never have been heard if I had remained at home." If this be so we must congratulate ourselves that the political troubles through which America has recently passed drove Dr. Marion Sims to Europe, inasmuch as it has led to the publication of this most instructive and valuable work, one remarkable alike for the vigour and clearness of its style, the ingenious adaptation of treatment to morbid conditions, and the earnestness and single-mindedness it evinces as the characteristics of the author.

Dr. Sims did not propose to himself to write a complete monograph on uterine surgery or on the treatment of sterility, but simply to interweave the two, while taking a glance at such surgical difficulties as seem ordinarily to interfere with conception; but we must say he has in so doing given us a work replete with information on almost all the forms of disease usually met with in the female organs of generation. He arranges his cases into two classes. 1st. Natural sterility—those who had never conceived; and 2nd. Acquired sterility—those who had, but for some reason had ceased to do so for a time, say five years or more; and on looking over his notes for a series of years he was surprised to see how nearly equal these two classes were; that is taking all cases of uterine disease as they are promiscuously presented, though of those who seek advice merely for sterlity, without reference to disease or actual suffering, the first class will, of course, greatly predominate. It is only by the study of all, he says, that the conditions can be ascertained that are most opposed to conception, and, at the same time, those most favourable to it. In the following passage we have a summary of the unfavourable conditions:—

> "The trouble in one case may depend upon mere contraction of the os: in another, upon malformation of the same—in another upon engorgement of the cervix—in another upon elongation—in another upon hypertrophy—in another upon simple induration—in another upon curvature of the canal of the cervix—in another upon polypus—in another upon a fibroid—in another upon malposition of the uterus—in another upon some anatomical anomaly or malformation of the vagina—in another upon vitiated secretions of the cervix—in another upon those of the vagina, the one generally acting mechanically, the other chemically—in another upon the absence of spermatozoa; while others may be complicated with several of these anomalies, all subjects of study and investigation.
>
> "And when we come to analyze these various causes and complications, they are resolved into one great general principle, embracing all manner of obstructions to the free passage of living spermatozoa into the cavity of the womb. In all curable cases ovulation must be perfect, and the faulty link must be found in defective fructification, or else all our efforts are in vain. If the woman has passed the period of ovulation, of course we can do nothing for her. If the ovum never passes into the fallopian tubes, a thing impossible to determine, it is equally beyond remedy. We may safely assume a normal menstruation as a sign of normal ovulation. This being our guide, we may hope, in the majority of cases, to find some of the troubles above enumerated, many of which are eventually curable."

The conditions essential to conception are stated as follows; and Dr. Sims takes them up *seriatim*, and proposes to show, from clinical experience, wherein the sterile condition differs from the fecund, and to point out, so far as is known, the direct methods of relief:—

> "1.—It occurs only during menstrual life.
>
> "2.—Menstruation should be such as to show a healthy state of the uterine cavity.
>
> "3.—The os and cervix uteri should be sufficienty open to permit the free exit of the menstrual flow, and also to admit the ingress of the spermatozoa.
>
> "4.—The cervix should be of proper form, shape, size, and density.
>
> "5.—The uterus should be in a normal position, *i.e.*, neither anteverted, nor retroverted to any great degree.
>
> "6.—The vagina should be capable of receiving and of retaining the spermatic fluid.

"7. Semen, with living spermatozoa, should be deposited in the vagina at the proper time.

"8.—The secretions of the cervix and vagina should not poison or kill the spermatozoa."

Before entering more fully into the subject Dr. Sims devotes some consideration to the method of making a uterine examination, and describes his own plan. For examination by touch he prefers the dorsal decubitus, whilst for examination by sight he uses the left lateral; and in all cases the speculum known by his own name, or as the "duck-bill." The dorsal decubitus is in many cases essential, especially if we wish to trace the outline of the uterus through the abdominal walls, either by the bi-manual method, so clearly explained by Dr. Sims, or by the use of the uterine sound; but it is more annoying to the patient, and not so advantageous, in our opinion, in the majority of cases, as the lateral, or ordinary obstetric position of this country. With regard to the speculum we would make a similar remark—in very many cases Sims' speculum is useful beyond all others; and it presents this advantage, that with it we can touch with the finger, at the same time that we see clearly, the parts under examination; and we know of no other speculum by which this can be done; but in most cases Ferguson's glass speculum answers every purpose, and is more easily used, and less likely to pain or annoy the patient. However, the usefulness of a speculum does not depend so much on its form as on the skill with which it is used; and whether it be Sims', or Ferguson's or Ricord's is not so important as that it should be used with gentleness and care. The same may be said of the uterine sound, of which Dr. Sims proposes some modifications. We ourselves make constant use of Simpson's original form, and see no reason to change it; we may sometimes wish it were made of copper or some substance more easily bent, but the marks for measuring the length to which it may have passed into the uterus, we regard as indispensable. Dr. Sims objects to them as making the instrument difficult to clean, but we certainly have never had any difficulty with it in this respect. On the whole we think Dr. Sims does not value the sound so much as we do. To one so expert its use may not be very essential, but to us it is the most valuable instrument in the *armamentarium chirurgicum*, enabling us, as it does, to touch, feel, and manipulate parts otherwise inaccessible. However these are matters of too little importance to keep us from the substance of the book.

The first section is devoted to the illustration of the proposition, that "conception occurs only during menstrual life," we shall not dwell on this, but pass to the next, which shows that "menstruation should be such as to show a healthy condition of the uterine cavity." This section opens with the following definition of healthy menstruation, and of some of its deviations:—

> "If asked what constitutes normal menstruation, I should reply, a painless uncoagulated flow, returning at intervals of about four weeks, lasting three, four, five, or six days, and requiring the use of not more than three, or, at the farthest, four napkins in the twenty-four hours. It may vary from a healthy standard in both quantity and quality. It may be scanty or profuse, and painful or not, without regard to quantity. If the flow falls short of three days' duration, it may be called scanty. If it continues longer than six or seven days, it may be profuse, but not always so. It may be very abundant, and last but two or three days; and, again, it may continue twelve or fifteen days, and be very scanty, requiring not more than one napkin in the twenty-four hours. The explanation of either of these conditions will generally be found in some organic deviation from a normal state.
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> "Conception may take place whether the menstruation be scanty or profuse. But either extreme is not very favourable to it, not that the amount of blood lost is *per se* an important matter, except as the index of an organic condition, favourable or otherwise to the fulfilment of this great law of nature."

Of scanty menstruation Dr. Sims has not much to say, but his remarks on the profuse form are of very great value. He does not think it often depends on constitutional causes, or can be cured by constitutional treatment. He knows very well, he says, it may arise from mere debility, from superlactation, and from some temporary engorgement of the portal system; but such cases are not very common, and not usually obstinate. He would never, therefore, put off a uterine exploration in any confirmed case of abnormal flow, for where there is an inveterate menorrhagia there will always, he says, be some organic cause for it:—

> "It may be due simply to granular erosion; to engorgement of the cervix; to fungoid granulations in the cervical canal, or in the uterine cavity; to polypi of the os, the cervix, or the cavity; to a fibroid tumour, intra-uterine or intra-mural; to inversion of the uterus, to hematocele; or it may be a sign of some malignant degeneration, all giving rise to hemorrhage, and each requiring its own peculiar and appropriate management.

"I propose to illustrate, from clinical experience, the surgical treatment of menorrhagia as it may originate from one or the other of these sources."

Cases of menorrhagia from each of these causes are now given, each of which may be regarded as a type, and is made the starting point for remarks on the treatment of the class to which it belongs. For the treatment of granular erosions Dr. Sims makes use of chromic acid. A drachm of this salt is dissolved in a drachm of distilled water, and is applied to the granulations by means of a solid glass rod, which is only allowed to take up a drop or two. It produces no pain, and may be carried into the canal of the cervix, or even further.

The case of menorrhagia, from fibrous engorgements of the cervix, was one of acquired sterility; the neck of the womb was the seat of fibrous engorgement, with superficial granular erosion. It was considerably hypertrophied and indurated. The organ was in its normal position. The thickened and indurated lips of the os uteri were, in consequence of their hypertrophy, in close apposition, the one against the other; thus mechanically closing the os, although it was large enough to admit a No. 8 bougie. The granulations were cured by the use of chromic acid; still the menorrhagia continued; the cavity of the uterus was explored by means of a sponge tent, but there was nothing abnormal there. It was now determined to incise the os, for which there were two reasons:—1st. Division would probably ameliorate the engorgement and lessen the hemorrhage. 2nd. It would separate the lips so as to allow of the entrance of spermatozoa, and permit conception, which it was hoped would cause a complete revolution in the nutritive functions of the whole organ, and ultimately a perfect cure. In three months after the operation menstruation was perfectly natural, and in nine months more the patient was delivered of a fine vigorous child, after an acquired sterility of nine years.

Fungoid granulations, resembling those so often seen in burns and chronic ulcers, are sometimes the source of menorrhagia. They may be found in the canal of the cervix, or in the cavity of the uterus, or in both at the same time; so that when a vaginal examination fails to ascertain the cause of the profuse flow it is necessary to explore the cavity of the cervix and of the uterus itself. This is to be done by the use of sponge tents. For the manufacture and use of these very full directions are given, differing but little from those originally given by Sir James Simpson; but Dr. Sims has ascertained the very interesting and important fact that the use of these tents will not merely dilate the uterus, but by their pressure cause the removal of granulations, and even of mucous, and, in some cases, fibrous polypi. Their use, however, is not devoid of danger. At first Dr. Sims allowed his patients to go about with them in, and allowed them to be retained in the uterus twenty-four hours, or more; but he soon found that metro-peritonitis or other serious mischief might be produced in this way, and he became convinced that they should not be applied unless the patient consent to remain indoors, if not in her bed-room, for a week; and this even when only used for a day; and he now leaves the tents in the uterus little more than five or six hours. In this way he believes the use of tents as safe as any other remedy capable of doing good; and he finds that placing a piece of cotton, saturated with glycerine, in the vagina prevents their acquiring the peculiarly offensive smell that is so often an objection to their use.

Menorrhagia from polypus is the next form considered; viewing polypi surgically Dr. Sims classifies them topographically as follows:—

1st. Those growing from the os tincæ.
2nd. Those growing in the canal of the cervix.
3rd. Those growing in the cavity of the uterus.

Referring to the hemorrhage that sometimes follows the removal of polypi by the scissors, Dr. Sims narrates his experience of the use of the styptic salts of iron, of which he prefers the persulphate, as he has found it difficult to obtain the perchloride free from acid, which, when present, irritates the mucous surface of the vagina. In our own practice we make constant use of the saturated solution of the perchloride in glycerine, as recommended by Sir James Simpson, and have had no reason to complain of its causing any irritation. After using the solution of iron Dr. Sims applies cotton saturated with glycerine, a dressing that he employs in all his surgical operations on the neck of the womb, and in other cases of organic lesion. From the great affinity of glycerine for water he believes it causes a capillary drainage by osmosis, depleting the tissues with which it comes in contact, and giving them a dry, clean, and healthy appearance.

In the diagnosis of polypous tumours Dr. Sims believes his method of exploration cuts the Gordian knot; and he relates a case that had been regarded as one of carcinoma, till examination with his speculum showed it was a mushroom-shaped fibrous polypus, growing from the os, and so completely covering and forming a cap for it, that to the finger it presented only a knobby hard growth, occupying the place of the cervix, and the os could not be felt.

Small polypi in the canal may be removed by the pressure of a sponge, cut off with scissors, or pulled off with a forceps; for this latter purpose Dr. Sims recommends M'Clintock's fenestrated forceps, of which he gives a figure. For large polypi, where the scissors cannot be used, Dr. Sims recommends the écraseur. He has added a porte-chain to Chassaignac's instrument, by which the chain may be rendered stiff, and carried into the vagina or the cavity of the uterus as easily as a sound, and then expanded so as to facilitate its being passed over the tumour. Dr. Sims gives cases illustrating the several varieties of polypi, and closes the series with the following:—

> "Time was when women died of polypi without any effort being made for their relief. This is not so now. No delicate operation is easier; none more successful. Life is sometimes lost because we think the patient so near death that any interference would only accelerate the fatal issue. This is a great mistake. To save life where death is imminent, we are justified in assuming great responsibilities and even of taking great risks. I fear that we sometimes hesitate to do our duty by asking ourselves the question, 'How will it affect me if I fail?' It has been said of a great American lithotomist that he often refused his skill to bad cases because they might spoil the statistics of his unparalleled success.
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> "In December, 1861, Mr. Preterre, an eminent American dentist in Paris, asked me to see Madame R., in consultation with her physician. She had menorrhagia for many years, and was extremely prostrated by it, and by a profuse muco-purulent vaginal discharge, which had been present for six or eight months whenever the hæmorrhage ceased. She had been seen by many of the most eminent surgeons in Paris, but no one suggested anything for her relief. I found the uterus retroverted and greatly enlarged, the fundus extending quite to the hollow of the sacrum, and seemingly filling up the whole of this region. A glance showed at once that it could be but one of two things—a polypus or a fibroid tumour. The os tincæ admitted the end of the index finger. I was anxious to determine the nature of the case, and made gentle but persistent pressure for some minutes through the cervix. It gradually yielded to the force, and the finger, gliding into the cavity of the uterus, detected an enormous fibrous polypus, which could not pass outwards because of the retroflexion. I was obliged to be in London the next

morning, but I promised to return to Paris in a week, for no other purpose than to apply a sponge tent and remove the polypus for Madame R. Five or six days after my departure they telegraphed to me that she was much worse; that a consultation of physicians had decided that it was now too late to attempt any operation, and therefore that it was unnecessary for me to return to Paris. Fortunately, the telegram was not received, and I returned to Paris to find my patient in a state of complete exhaustion. She had a profuse, dirty, offensive, sero-sanguinolent discharge from the vagina, which poisoned the atmosphere of her apartment. Her pulse was small and rapid; she was quite anæmic, and presented all the appearances of blood-poisoning. On passing my finger into the vagina, I found it entirely filled by an immense fibroid polypus in a state of decomposition. She was evidently dying from the absorption of the detritus of this fetid mass. At my first visit, a week before, this tumour was wholly intra-uterine, but now it filled the vagina. I infer that its escape from the cavity of the uterus was due to powerful contractions provoked by the forcible introduction of the finger for exploration, for she grew worse from the moment of my visit. She had forcing pains, as of labour, for a while, and afterwards passed into the low condition in which I found her. Its pedicle (as is most usual) grew from the anterior wall. What was to be done? There was assuredly but one course to pursue. If we allowed this great mass to remain there and slough away, death was absolutely certain. Its speedy removal gave the only hope of rescue. Her physicians consented to its écrasement, which occupied ten or twelve minutes. Vaginal washes, wine, and generous diet soon completed the cure. If I had received the telegram, she would certainly have died, and I should have been censured by her friends for hastening the fatal issue, inasmuch as my previous visit was the inauguration of a new phase of her sufferings. If I had been afraid to operate because she was almost in a moribund state, she would unquestionably have been lost.

"I have related this case perhaps too minutely, but it is to encourage the young man never to falter in the clear path of duty to his patient, and to show that extreme exhaustion is no barrier to the mere operation; for, when effected by the écraseur, there is no danger of hemorrhage, and very little of any other character."

Menorrhagia from fibrous tumours and that from inversion of the uterus are next considered, and then Dr. Sims passes on to painful menstruation. As a general rule, he does not think fibrous tumours ought to be interfered with unless they endanger life; and then he prefers Dr. Savage's plan of injecting tincture of iodine into the uterus—having first dilated the os with sponge—to the other plans of treatment.

Painful menstruation, Dr. Sims believes, to always depend on mechanical obstruction. "I lay it down as an axiom," he says, "that there can be no dysmenorrhea, properly speaking, if the canal of the neck of the womb be straight, and large enough to permit the free passage of the menstrual blood." At one time Dr. Sims believed menstruation might be painful without any mischief or impediment, simply because Dr Bennet and others said so; but now he is convinced that there is no such thing as "constitutional dysmenorrhea." "Painful menstruation is only a symptom of disease, which may be inflammation of the cervical mucous membrane, retroflexion, anteflexion, fibroid tumour in one wall of the uterus or the other, contraction of the os internum or externum, flexures of the canal of the cervix, either acute or gently curved, either at the os internum, at the insertion of the vagina, or extending throughout the whole length of the canal; all of which are so many mechanical causes of obstruction which must be recognized and remedied if we expect to cure dysmenorrhea."

This same view has recently been so fully illustrated in a paper on dysmenorrhea, read by Dr. Kidd before the Obstetrical Society, and published in our number for November last, along with an account of the methods of treatment founded on it, that it seems unnecessary to dwell on the subject at present.

III. The third section of the work illustrates the third of the propositions laid down at the commencement, viz.:—"The os and cervix uteri should be sufficiently open not only to permit the free exit of the menstrual flow, but also to admit the ingress of the spermatozoa." Cases are given proving that though there may not be dysmenorrhea or other symptoms of disease, the os may be too small, or so placed as to prevent the entrance of spermatozoa. This condition may either be natural or acquired, the os being often closed as the result of the injudicious use of caustic, and for its removal the os must be incised as in dysmenorrhea. Under this head Dr. Sims figures a condition of the os that we have frequently met with, where a projection on the anterior lip gives the os a crescentic shape and forms a valvular obstruction to the entrance of spermatozoa. A case of this kind is detailed where the projection was excised, and conception soon followed; and other cases are given where the posterior lip was the cause of the obstruction from its being so long as to overlap the opening; in some of which it was removed, and in others slit antero-posteriorly, with happy results.

IV. "The cervix uteri should be of proper size, form and density."

Two deviations from the natural size are spoken of here:—1st. Elongation; 2nd. Defective development. For elongation amputation is recommended, and the method of doing it is described; and for some cases of deficient development of the cervix slitting the os is suggested, but no case is given in which this had been done.

In form the cervix may vary from the normal by being conical, long, or curved; and here also amputation is recommended, and a guillotine-shaped instrument is recommended for the purpose.

For induration of the cervix, the remaining subject treated of in this section, Dr. Sims has nothing new to suggest. The use of caustic potash he does not recommend; he has found Dr. Churchill's iodine treatment produce a greater amelioration than anything else, but it is tedious, and often fails; where there is much fibrous deposit Dr. Sims incises the os; and where it is possible to amputate the indurated part, he does so.

V. "The uterus should be in a normal position, *i.e.*, neither anteverted nor retroverted to any great degree."

In the following table Dr. Sims shows how frequently he has met with these forms of malposition in his two classes of natural and acquired sterlity:—

	"No. of Cases	Anteversions	Retroversions	Total Malpositions
1st Class ...	250	103	68	171
2nd Class ...	255	61	111	172
Total ...	505	164	179	343

"Thus we see in 250 married women, who had never borne children, that 103 had anteversion, and 68 retroversion; while in 255 who had once borne children, but for some reason ceased to conceive before the natural termination of the child-bearing period, 61 had anteversion, and 111 retroversion, the sum total in each class bearing almost exactly the same relation to the number observed, being about two-thirds of the whole. Hence we infer that if the malposition exercises an influence to prevent conception in the one class, it is of equal importance in preventing it in the other. The mere position of the uterus is here stated without reference to causes or complications. I have purposely avoided saying how many of these had granulations, engorgements, hypertrophies, fibroids, ovarian cysts, or other complications. The table shows that two-thirds of all sterile women labour under some form of uterine displacement, without reference to the particular cause of such displacement;

and that the anteversions and retroversions in the two classes are in inverse proportion: the anteversions in the first being about equal to the retroversions in the second; and the retroversions of the first nearly the same as the anteversions of the second."

The pathology and mechanism of these conditions are very fully considered in this section, but Dr. Sims is not very hopeful as to the treatment of anteversion:—

"So far as the treatment of the sterile condition in connexion with anteversion is concerned, I fear that our efforts must be confined almost wholly to seeing that the os tincæ is open enough, that the cervix is of proper form and size, and that the secretions of the vagina and of the cervix are suited to the viability of the spermatozoa."

In some aggravated cases Dr. Sims has corrected the anteversion by shortening the anterior wall of the vagina; but, as a rule, the only treatment he recommends is a ball pessary, or rather a ball of cotton and glycerine, placed in the anterior *cul de sac* of the vagina.

Dr. Sims objects very much to the use of the sound for correcting displacements. He scouts the idea of curing them by even daily replacing the organ in its natural position. The sound may be used to correct retroversion, but for this purpose it is, in his opinion, a most dangerous instrument, and for anteversion it is utterly unnecessary. For retroversion he suggests a method of manipulation by a species of double touch, one hand acting from the surface of the abdomen, one from the vagina by means of a sponge probang. He has also devised a jointed sound to be used as a "redresser;" but as we are in the habit of using Simpson's sound for the purpose almost daily, and have never found any injury to arise from its use, and as the multiplication of instruments is an evil, we do not intend at present to provide ourselves with Dr. Sims' redresser. For retaining the uterus in its place after the retroversion has been corrected Dr. Sims is very warm in his commendations of the closed lever pessary, invented by his countryman, Dr. Hodge, the same that we have so frequently recommended to our readers in the pages of this Journal. In some rare cases, where the vagina is too irritable to bear any instrument, it is necessary to use cotton, and Dr. Sims figures an instrument he has devised to enable patients to introduce these themselves.

Though not included in the heading of the chapter, procidentia uteri is also discussed in this section. In addition to the ordinary forms of procidentia, where the uterus is elongated, and the os forms the lowest part of the tumour, the fundus still remaining within the pelvis, Dr. Sims says he has met a few cases where the whole uterus has descended through the vulva, and describes one shown to him by Dr. Chepmell, of Paris, in a maiden lady some forty years old, who had suffered from it twelve or fifteen years. The great peculiarity of this case consisted in the fact, that the uterus was but one inch and a half deep. This is a rare form. At present we have a case of it under observation in a woman between fifty and sixty years of age, who has borne children. Prolapse of the posterior wall of the vagina seems to have occurred after the birth of her first child; then, on making some exertion, under the influence of a strong mental emotion, she felt something slip through the vulva, which seems to have been the uterus, and has remained down ever since, except when pregnant. She has had one child since, at the full period, and a miscarriage.

The tumour lies outside the vulva; the os uteri is directed forwards; the fundus is near the anus; the uterine cavity measures the normal length. In the descent of the tumour the posterior wall of the vagina first protrudes, till the os makes its appearance at the vulva, and then the fundus slips into the pouch formed by the prolapsed posterior wall of the vagina. The anterior wall of the vagina does not come down at all. The more common form of prolapse is associated with longitudinal hypertrophy of the uterus—a condition first fully described by Huguier. In this form the utero-cervical canal is often found four or five inches deep; the supra-vaginal portion of the cervix being slender and attenuated; and, when examined per rectum, feeling not larger than the finger. Dr. Sims says this is evidently secondary—a statement that quite accords with our own experience; and, on several occasions we have demonstrated to the hospital class, that when the uterus has been properly supported by a pessary the elongation disappears. Within the last few days a patient presented herself for whom a pessary had been applied about twelve months before; at that time the uterus measured five and a half inches in length; the pessary had kept it well in its place; and, on examination, it measured not more than three inches.

It was necessary to remove the pessary for a time; and, at the expiration of a week, the os was again found to protrude through the vulva, and the cervico-uterine canal to be again upwards of five inches long. Our own experience shows us that in the great majority of cases a well-fitting pessary will correct this displacement, and, for this purpose, we find the boxwood disc pessary the most useful. In using it, however, Dr. M'Clintock's caution as to the size of the central aperture, must always be borne in mind, as, if too large, the cervix will pass through and become strangulated. In young women, however, anxious to have children, and in some aggravated cases, operative means may be necessary; but, where this is not required, the parts may be supported by the pessary we speak of, or by cotton, as suggested by Dr. Sims.

Three methods of operating are now before the profession:—

1st. Amputation of the cervix, as suggested by Huguier, and which we quite agree with Dr. Sims in restricting to those cases where the elongation affects only the portion of the neck that lies below the insertion of the vagina—a condition for which we have, ourselves, operated with complete success.

2nd. The perineal operation, as performed by Baker-Brown, Savage, and others. To this Dr. Sims objects that the new perineum made by it often gives way in consequence of the pressure of the parts above.

3rd. The operation of narrowing the vagina by the "trowel or triangular shaped" denudation on its anterior wall, as performed by Dr. Sims and Dr. Emmet.

This latter is rather a complicated operation, but Dr. Sims speaks very favourably of it; he has never known it fail but once, and the patient was subsequently cured by a repetition of it in a slightly modified form.

VI. "The vagina must be capable of receiving and of retaining the spermatic fluid."

In this section Dr. Sims proposes to review, first, the usual obstacles to the introduction of the semen, and then the conditions that prevent its retention or sojourn in the vagina. The ordinary obstacles to its introduction are mostly anatomical or mechanical, and may be arranged as follows:—

1st. The hymen may be imperforate, or nearly so.

2nd. There may be vaginismus, *i. e.*, hymeneal hyperesthesia, with a spasmodic contraction of the sphincter vaginæ.

3rd. There may be atresia of the vagina.

4th. The vagina may be wanting.

Of these the most important is vaginismus, for the treatment of which Dr. Sims recommends the removal of the hymen, and division of the sphincter, with subsequent dilatation.

The circumstances that prevent the retention or sojourn of the semen in the vagina Dr. Sims believes to be shortness of the vagina, and retroversion of the uterus.

VII. "For conception, semen with living spermatozoa should be deposited in the vagina at the proper time."

To some passages in this and the preceding section some critics have made grave objections. We must refer our readers to the chapters themselves, for a mere abstract of them would only lead to misapprehensions; but we must beg of them to remember, in reading them, that "to the pure in mind all things are pure."

VIII. "The secretions of the cervix and vagina should not poison or kill the spermatozoa."

The vagina and canal of the cervix each secrete a mucus peculiar to itself—that of the vagina is acid, that of the cervix is very slightly alkaline; and both may be altered by disease, so as to kill the spermatozoa. For vaginitis, Dr. Sims speaks highly of cotton saturated with glycerine, pure or containing astringents in solution; he also speaks favourably of medicated pessaries, both for vaginal and cervical leucorrhea; for the latter he has them made so that they can be passed into the canal of the cervix. Endo-metritis is another source of unhealthy discharges; and with some remarks on this the last chapter ends.

"A book, sir," said Dr. Johnson, "cannot contain more than the full of it;" but we assert that this book not only contains the full of it—and that of right good quality—but, by its suggestiveness, is worth even more than that which it contains.

Collection de Memoires sur une Fonction peu Connue du Pancréas, la Digestion des Aliments Azotés. Par LUCIEN CORVISART, Médicin Ordinaire de l'Empereur, &c., &c. Paris: Victor Masson & Fils. Pp. 206.

Collection of Memoirs concerning a Function of the Pancreas Little Known, viz., the Digestion of Azotised Aliment. By LUCIEN CORVISART, Physician in Ordinary to the Emperor, &c., &c. Paris. Pp. 206.

On the Nature, Cause, and Treatment of Tuberculosis. By HORACE DOBELL, M.D.; Member of the Royal College of Physicians, &c., &c. John Churchill & Sons. 1866. Pp. 83.

FROM the titles merely of the works which are here placed together one might not suppose that there was any bond of union between them.

The first is a reprint of memoirs on a certain function of the pancreas. The second, also a reprint, is an exposition on the treatment of tubercular disease by means of fatty matter emulsified by the aid of the pancreatic fluid, or rather pancreatine.

The former has to do with the pancreas as an organ which prepares nitrogenised matters for digestion; the latter, with the functions of the same organ in preparing fats for assimilation.

Dr. Corvisart's book gives his researches from the year 1857 to 1863; he has, therefore, added considerably to what he had done when his views were put forward in a very able analytical review published in this Journal in November, 1858. Our readers may remember that the review alluded to elicited from Dr. Brinton a letter, published in this Journal, August, 1859; and the additions which M. Corvisart has made to his former memoirs is chiefly with a view to refute Dr. Brinton, and those physiologists who do not agree with him in attributing to the pancreas an important function as regards the digestion of nitrogenous substances.

It would be quite foreign to our purpose to enter at length into a discussion of the question at issue. With every intention to be honest and truthful the most careful physiologists will often fall into error; and when, therefore, a discrepancy exists as to the actual results of experiments, we must, in the main, be determined by the weight of evidence on one side or the other.

Now, with regard to the functions of the pancreas in digestion, it may be said that physiologists are pretty well agreed in accepting the conclusions of Professor Claude Bernard, with reference to the action of pancreatic fluid on fatty matters; with regard to M. Corvisart's view that this fluid has a powerful solvent action on albumen, converting it into peptone, matters are, however, quite different. At the conclusion of his preface, M. Corvisart gives a letter from M. Longet, in which the latter expresses his conviction of the accuracy of M. Corvisart's researches.

With this exception, however, we are not aware of any other physiologist of note who does not look on M. Corvisart's assertions as "not proven," while those who, like Keferstein, Hallwachs, and Brinton, have made the subject one of careful experimental research, have obtained results differing from his. In the letter already mentioned[a] Dr. Brinton gives what appears to us to be a very satisfactory explanation of the want of accord between the experiments which have been undertaken to test the solvent action of fresh pancreatic juice on hard-boiled white of egg. In his work, more lately published, on *Food, and its Digestion*, he does not materially modify the opinion formerly expressed. He there says, of the pancreatic fluid, that its action on the various protein compounds has not yet been established. But there are striking facts which vaguely indicate some important relation between this secretion and these constituents of the food. It is true that the fresh pancreatic juice and the infusion of the gland substance in all stages of digestion are quite incapable of dissolving albumen. But both the secretion and infusion of the gland acquire this power so rapidly in their progress towards decomposition, and in advanced stages of this process, dissolve albumen in a quantity and with a rapidity so closely akin to the copious and energetic solution of albumen effected by the secretion and infusion of the stomach, as to promise the discovery of some valuable physiological clue to both these processes of solution as the reward of future research. The more so that (as Dr. Corvisart has pointed out) the resulting solution has many of the reactions of peptone; and that the solution of albumen in this manner is specific to the pancreas, in the sense of being utterly absent even from those salivary organs (parotid, submaxillary, sublingual, &c.) which are in other respects most closely allied to the pancreas, both in structure and function. Nevertheless, the distinction between the putrid and unstable solution into which the secretion and infusion of decomposing pancreas convert albumen, and the perfectly fresh and stable peptone of the gastric juice, as well as the contrast of those circumstances which conditionate the act of solution itself, justify our denying the claims of the pancreas to rank as a solvent of albumen and other protein compounds in the healthy digestion of the living body until it is shown how these circumstances in themselves, generally so injurious to health and life, and, therefore, conclusive against the normal character of the act which involves them, are modified or prevented during the ordinary action of the pancreas as an agent in the digestive process.

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[a] Dublin Quarterly Journal, August, 1859.

Dr. Dobell's little volume is a reprint of papers which have already appeared in the *British Medical Journal*, and the *Lancet*. It consists of two essentially distinct parts—one giving his theory of tuberculosis and its treatment; the other containing reports of cases treated with pancreatic emulsion—that is, fat emulsified by pancreatic juice.

Dr. Dobell's hypothesis is as follows:—

> "Tuberculosis is due to defect in the action of the pancreas on the fat taken as food (especially the solid fat). The supply of properly prepared fat is cut off from the blood: 1, by the fats not being brought into a proper condition by the pancreas; 2, by loss of absorbing power in the small intestine, due to the contact of unhealthy pancreatic juice and of defectively prepared food with its mucous membrane. Thus, the blood becomes deficiently and defectively supplied with fat-elements from the food; is unable to afford those required for direct combustion; does not replace those taken up during interstitial nutrition; but, on the contrary, takes up more to compensate the deficient supply from the food. This having gone on up to a certain point, the fat-elements of the albuminoid tissues are seized upon, and these tissues are minutely disintegrated in the process. This disintegrated albuminoid tissue is nascent tubercle; and this process of disintegration is tuberculisation."

According to the theory thus put forward pure tuberculosis commences when fats properly acted on by the pancreas cease to pass in normal proportion into the blood; and tuberculisation commences when albuminoid tissue is abnormally seized upon for its fat elements. It will, no doubt, be a novelty too startling to many of our readers at once to merit acceptance, to learn that the pancreas is the all-important organ, the functional derangement of which lays the foundation of all those terrible scourges of humanity—tubercular diseases. True to his theory, Dr. Dobell thus lays down his principles for the successful treatment of tuberculosis:—

> "If tuberculisation, even in the smallest degree, is going on, the first and most urgent need is to supply fats. Olein should be given for absorption by the portal system, thus to afford, so far as it is able, materials for combustion. But, above all, FATS ACTED UPON BY PANCREATIC JUICE are called for, and must be supplied until the deficiency is removed, the just balance restored, the process of tuberculisation stopped. Until this point is arrived at—until the balance is turned in favour of the albuminoid tissues—everything which favours the reception of oxygen into the blood, everything which increases the wear and tear of the body, everything which calls for the generation of animal heat, directly favours tuberculisation, and precipitates the patient into the very catastrophe we wish to avert.

"On the other hand, so soon as the balance has been turned in favour of the albuminoid tissues, and tuberculisation has been artificially arrested, everything which postpones the restoration of the function of the pancreas directly favours the conversion of a temporary into a permanent disease. But moderation is essential to success. Too great and too sudden a demand upon a weak and defective pancreas may only paralyse the organism in its attempts at restoration of function. It is, however, impossible to magnify the importance of periods of arrested tuberculisation, whether artificially or naturally produced. They are the bright opportunities for the permanent restoration of pancreatic function. Too often these opportunities are wasted. The patient and his friends, pleased with the marked improvement that has taken place under some plan of treatment, either continue this treatment long after its proper time and place have passed by, or give up treatment altogether, content to wait until signs of active disease return. In either case, an opportunity for establishing a permanent recovery is thrown away, and perhaps it may never return."

Although we cannot very readily accept Dr. Dobell's theory as to tuberculosis and its principles of treatment, yet we do not mean to say that the book is without merit. We confess, however, that we have a prejudice against books of this sort. When we bear in mind that the author is also author of a paper "On the Class of Medical Literature Most Needed in the Present Day," and when we see before us as a reprint of papers (very well suited for the journal in which they first appeared), a neatly got up little volume of about fourscore pages, not very closely printed, and the last leaves of which are devoted to "Works by the Same Author," and opinions of the press, therefore, we cannot help asking—is this the class of medical literature needed now-a-days? When we see that among the works by the same author is one "just published," the title of which (*On Winter Cough*) obviously addresses itself to the *non*-professional reader, we then think it our duty honestly to state our conviction—that Dr. Dobell's works do not belong to the class of medical literature most needed in the present day.

On the Use of the Sphygmograph in the Investigation of Disease. By B. W. Foster, M.D.; Professor of Clinical Medicine in Queen's College, Birmingham, &c. London: J. Churchill & Sons.

The last few years have been characterized by the numerous additions which have been made to our methods of diagnosis by mechanical appliances; and to the list M. Marey has added the sphygmograph, for which word of many consonants pulse-writer might be a convenient synonym. The discovery was made while that eminent physiologist was investigating the laws which regulate the circulation of the blood in health. The instrument was first used, in England, by Drs. Anstie and Burdon Sanderson; but the essay before us may be regarded as the first publication likely to introduce it to British practitioners, because of the numerous observations of its uses which it records.

As it would be most difficult to understand the construction of this instrument by verbal description, Dr. Foster has illustrated his work by excellent woodcuts; and has recorded thirty tracings of the pulse in health and in various forms of disease, which are considered so valuable by the inventor of the sphygmograph that he has asked permission to embody them in a future work of his on the subject.

In the following extract we give Dr. Foster's account of the mechanism of the instrument:—

> "The sphygmograph of Marey[a] affords us the necessary aid; and by it we can not only gain a knowledge of the finer differences which escape our touch, but also preserve for inspection a distinct trace of these delicate peculiarities. The accompanying woodcut (Fig. 1.), copied from Marey, shows us in the interior of the frame (Q R) the essential part of the instrument, which consists of a flexible steel spring (I), covered on its under surface, at its free extremity, with a convex plate of ivory (K). This ivory plate rests upon the artery to be examined, and, by virtue of the elasticity of the spring (I), exerts a certain pressure upon it. Each pulsation of the vessel raises the spring slightly at K, and the multiplication of this movement is obtained by means of a very light lever (A), which moves upon a pivot (C). The elevation of the spring is transmitted to the lever, very near to its centre of movement, by means of a bar of metal (B E), which moves round the point (E); this bar terminates

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[a] To the kindness of Dr. Anstie I owe my first acquaintance with the instrument; and to him we are, I believe, indebted for its first introduction to a medical society in this country.

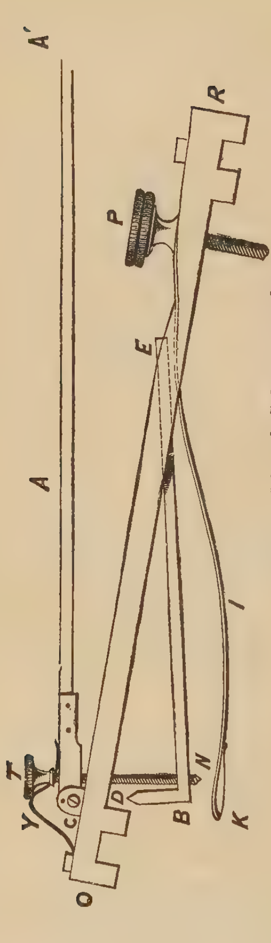


Fig 1.—Marey's Sphygmograph.

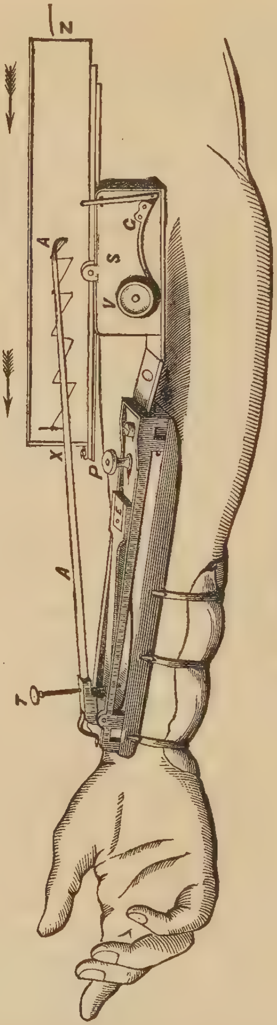


Fig. 2.—Sphygmograph applied to the arm.

in a vertical plate (B D), and is pierced by a screw (T). When the screw acts upon the spring, the connexion is established between the spring and the bar, and the movements of the spring are transmitted to the bar, and through its vertical plate to the lever. In order to insure the transmission of the movement, the plate (B D) must be in contact with the under surface of the lever; by means of the screw (T) we can arrange this, and regulate the interval between the point of the plate (B D) and the under surface of the lever. In order that the lever should not be projected too much upwards by sudden movement, and also that it should overcome any slight friction experienced in the paper at its terminal point (A), a small spring (Y) rests upon its fixed extremity, and presides over its descent. The screw (P) enables us to regulate the amount of pressure exercised upon the artery by the spring (I). The woodcut (Fig. 2), modified from Marey, shows the instrument placed upon the arm over the radial artery in the position for use. The lever (A) is here seen to carry at its free extremity a little pen, which, filled with ink, registers its movements upon the paper which covers the plate (X Z); this plate is moved at a uniform rate in the direction indicated by the arrows, by means of watch-work placed beneath in the case (S). Ten seconds are occupied by the passage of the plate. The button (V) enables us to wind up the watch-work; and the small regulator (G) starts the plate, or stops its motion as desired. The application of the instrument I have found much facilitated by the use of elastic bands, instead of a silk lace, as recommended by Marey. These bands embrace the arm, and are hooked on to the small projecting points on the metal framework, as seen in the diagram. The addition of a pad[a] to the under surface of the arm renders the instrument more easy to the patient, and prevents any pressure from the bands."

The tracing consists of as many curves as there were pulsations during ten seconds; each curve consists of a line of ascent, summit, and line of descent, which correspond respectively to the flow of blood after the contraction of the ventricle, the arrival of the blood in the artery, and the subsidence of the pressure on the vessel.

We select a few of the most characteristic of Dr. Foster's tracings to illustrate the uses of the instrument:—

Fig. 1.

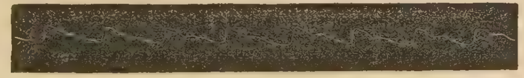
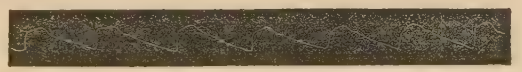


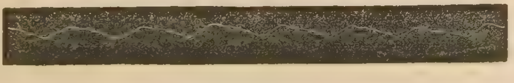
Fig. 1 represents the tracing which is made by the pulsations of the healthy artery.

Fig. 2.



The second tracing (Fig. 2) is that made by the inelastic artery of old age.

Fig. 3.



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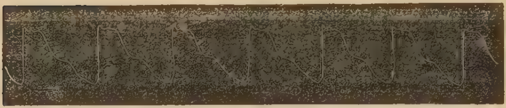
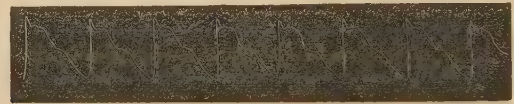
[a] I am indebted to my clinical clerk, Mr. Waters, for the suggestion of the pad.

Fig. 4.



The third and fourth (Figs. 3 and 4) are those which are made by the left and right radials in a case of subclavian aneuerism.

Fig. 5.



The last (Fig. 5) is very remarkable, and illustrates the tracing which is produced by the artery in cases of aortic regurgitation, which is so well known in this city by the writings of Sir D. J. Corrigan.

Among the morbid conditions, therefore, which will be in future more easily discovered with the aid of this instrument, are the diminished elasticity of arteries which occurs with senile degeneration, aneurisms on the vessels nearer to the centre of the circulation, and aortic patency; and, without doubt, as the instrument comes into extensive use so many observations will be recorded that valuable information will be afforded in the diagnosis of all diseases in which examination of the pulse by the finger has hitherto been relied on. To this end Dr. Foster's treatise much conduces, for it contains a most explicit, full, and undoubtedly faithful description of the applications of the instrument by a practical physician and an industrious clinical teacher.

New Observations upon the Structure and Formation of Certain Nervous Centres, tending to Prove that the Cells and Fibres of every Nervous Apparatus form an Uninterrupted Circuit. By Lionel S. Beale, M.B., F.R.S. London: 1864.

In this memoir Professor Beale arrives at results which differ very materially from those of preceding observers. The preparations which he describes and figures, have all been taken from the ganglia of the common frog, or little green tree-frog, but the conclusions arrived at from the examination of these, are found, on the investigation of the ganglia of other animals, to be of general application, and, hence, are of very great interest, as giving a more consistent account of the anatomy and development of this part of the nervous system, than any that has yet been offered.

The author commences by showing that apolar and unipolar nerve-cells have no existence, but that every nerve-cell is in connexion with at least two fibres, and probably influences those fibres only with which it is structurally continuous. In the frog the shape of the fully-formed ganglion cell is pyriform; near the larger extremity, or fundus, lies the nucleus, and from the smaller extremity come off the fibres.[a] Of these, one is straight and passes into the central part of the cell, with which it becomes continuous, while the other passes from the peripheral part of the cell, and winds, in a spiral manner, round its smaller extremity, and round the straight fibre; neither of these fibres reaches the nucleus. In the neighbourhood of the cell these fibres are pale and frequently contain masses of "germinal matter;" but in favourable specimens they can, one or both, be traced to true dark-bordered fibres, with which they are directly continuous, and hence their nervous character is clearly demonstrated; when the fibres reach the nerve-trunk in which they are to run, they separate from each other, and invariably pursue opposite directions.

In treating of the development of the ganglion cells and nerve fibres, Professor Beale gives, at some length, his theory of the nutritional and formation processes which take place in living bodies, which is now so well known as to render any notice of it here superfluous. He shows that in the fully developed frog new ganglion cells are formed in three ways:—1st. From a nucleated granular mass, like that which forms the early condition of all tissues. 2nd. By the division and splitting up of a mass like a single ganglion cell; this mode of multiplication occurs only at a period before the cell has acquired its perfect form, and prior to the development of the spiral fibre. 3rd. By changes occurring in what appears to be a nucleus of a nerve fibre.

According to Professor Beale, motion is one of the great characteristics of living matter; in accordance with this law the ganglion cell, as it grows, moves away from the spot where its development commenced; and the substance which originally formed part of the cell is subsequently drawn or spun out into the fibres. In some cases, particularly where cells are developed according to the third way mentioned above, the fibres at first appear to proceed from opposite ends of the imperfectly formed cell; but as the latter moves away they come to lie parallel to each other, and finally, as the cell approaches maturity, the one fibre is twisted in a spiral around the other, as already described. "The spiral appears to result partly from a sort of splitting and subsequent condensation of the lower portion of the cell itself, and partly by growing from the nuclei connected with the fibres, while, at the same time, the fundus moves away, and spiral after spiral is left around the central fibre, which is of course gradually increasing in length also. I think it doubtful if the entire cell *rotates*, because the central fibre does not appear to be twisted; but it is obviously possible that the outer portion of the cell might rotate round the inner portion without causing any twisting of the fibre, the mass, of which the cell is composed, being in the natural state, very soft and plastic."—P. 14. "There is a fact in favour of rotation which I have observed so often that it may be regarded as constant, that in peripheral parts where a dark-bordered fibre is being developed, a fine fibre passes spirally around it; and this may be accounted for in precisely the same way as I have attempted to explain the production of the spiral fibre of the ganglion cell."—P. 15. As the ganglion cell grows old the proportion of germinal matter diminishes, and the number of coils of the spiral fibre undergoes a great increase.

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[a] In this Dr. Beale differs from Julius Arnold, who has also described the straight and spiral fibres in connexion with the ganglion cells of the frog, but traces both fibres through the cell to the nucleolus. Journal de l'Anatomie, ii., 220.

In considering the ganglia of the heart, the author shows, in opposition to R. Wagner and Kölliker, that apolar cells do not exist, but that every cell is connected with at least two fibres, some of which certainly pass in a central direction, and that it is, to say the least, highly probable that many of the cells are in connexion with the *transcurrènt* fibres of the vagus.

Many ganglia are in connexion with the nerves accompanying the arteries, and the cells of these differ in no important particular from those of the ganglia found in other parts. No artery, however small, is entirely without nervous supply. Beale confirms an observation of Luschka, that nerve fibres sometimes are found on the inner side of the circular muscular coat separated from the blood only by the very fine inner coat. He has occasion here to differ again from Kölliker, who states that many arteries are quite destitute of nerves, and who "seems to conclude in too many cases, that what he has failed to see does not exist." The following observation is important as showing that in the same nerve fibre may be contained fibrils which fulfil very different functions:—"The nerves which supply the small arterial branches in the voluntary muscles of the frog come from the very same fibres which are distributed to the muscles. I have seen a dark bordered fibre divide into two branches, one of which ramified upon an adjacent vessel, while the other was distributed to the elementary fibres of the muscle."—P. 21.

At an early period of its development, the ganglion cell has no cell wall, but as it grows older it is surrounded by a fibro-nucleated tissue which may be described either as cell wall or matrix. This appears to be formed from the oldest and most degenerated part of the cell itself, the atoms composing it having previously existed successively as nucleolus, nucleus, and cell contents. The author's views on the relation of nervous to connective tissue are highly interesting. In true connective tissue, such as that forming the cornea, sclerotic or tendon, which "is developed as a special tissue, and may be said to fulfil a special purpose," the nerves can, by proper precautions, always be distinguished from the tissue elements, and the former never becomes continuous with the latter; but in certain indefinite forms of connective tissue such as that found surrounding nerve cells and fibres, it is often impossible to say with certainty whether an individual fibre or nucleus belongs to the connective or to the nervous tissue. It is more than probable that this indefinite tissue results from the wasting or degeneration of the nervous tissues themselves. "Nor is the nervous the only tissue which by normal wasting or abnormal degeneration, leaves what is termed connective tissue. A structure so special as a uriniferous tube, or a portion of the cell containing network of the liver, may waste, and all that represents it will be what is termed connective tissue, and connective tissue corpuscles."—P. 23.

The ganglion cells of mammalia are enclosed in a capsule of nucleated fibres. This which is generally believed to be formed of connective tissue, Beale looks on as analogous to the spiral nerve fibres which he has described in the frog. We may mention that Luys also, though taking a view of the structure of the nerve cell very different from that of Dr. Beale, combats the opinion which classes this nucleated sheath with the connective tissues, and looks on it as formed by a peculiar modification of nerve tissue, and as being an essential part of the cell.—*Recherches sur le Système Nerveux Cérébro Spinal*, p. 32.

The following passage is well worthy the attention of histologists, and with it we shall terminate this notice:—"It is possible that for many years to come, some observers will persist in terming every thing in which they fail to demonstrate distinct structure, connective tissue, and all nuclei which are not seen in their specimens to be in connexion with positive vessels, positive nerve fibres, or other well-defined tissues besides fibrous tissues, connective tissues corpuscles; but there is little doubt that when the changes occuring during the development of special tissues shall have been patiently worked out by the use of high powers and better means of preparation, opinions on the connective tissue question will be completely changed. The idea of the necessity for a supporting tissue or frame-work will be given up, and many structures now included in 'connective tissue' will be isolated, just as new chemical substances year after year are being discovered in the indefinite extractive matters."—P. 25.

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1. *The Common Nature of Epidemics.* By SOUTHWOOD SMITH M.D. 1866. London: N. Trübner and Co. Pp. 130.
2. *Notes on Cholera, its Nature and Treatment.* By GEORGE JOHNSON, M.D. 1866. London: Longmans, Green, and Co. Pp. 112.
3. *Cholera in its Home.* By JOHN MACPHERSON, M.D. 1866. London: John Churchill and Sons. Pp. 155.
4. *Cholera—its Symptoms, Causes, and Remedies.* By THOMAS A. WISE, M.D., &c. 1864. Cork: J. J. Bradford. Pp. 60.
5. *Le Choléra ou Typhus Indien Epidemie de* 1865. Par le Docteur CHARLES PELLARIN. 1866. Paris: J. B. Baillière et Fils. Pp. 72.
6. *Le Choléra et Le Congrès Sanitaire Diplomatique International.* Par le Docteur J. P. BONNAFONT. 1866. Paris: J. B. Baillière et Fils. Pp. 44.
7. *Cholera.* By WILLIAM STORY. 1865. London: E. and F. N. Spon. Pp. 79.
8. *Essay on the Nature and Treatment of Cholera and Fever, with Medical Remarks on the Treatment of Cattle Plague.* By JAMES TUCKER, M.D. 1865. Dublin: John Falconer. Pp. 40.

DURING the past twelve months cholera has again become a subject of immediate interest to European physicians, and a great addition has in consequence been made to its literature. Some of the conclusions with regard to its propagation, its pathology, and its treatment, which were considered as most firmly established, have been questioned; these disputed views are the very ones which, if admitted, would most decidedly influence our practice, we feel called upon, therefore, to bring the whole subject before our readers; in doing so we cannot avoid repeating some facts which to many of them are well known, but we desire to dwell at length only on the important issues which have recently been raised.

The description by Willis of the disease called griping of the guts, which prevailed in London two hundred years ago, reminds us so forcibly of cholera that we are hardly justified in asserting that in former times it may not have been an indigenous disease; during the past half century, however, when it has prevailed, it appears not to have arisen in our midst but to have come to us; it has reached us from the continent of Europe, and it has reached the continent from the East; last year it appeared to originate in Arabia, under circumstances to which we will more fully allude; but on former occasions it seemed to start from India, and more particularly from Lower Bengal, which has come to be regarded as its home; certain it is that there it is always present, just as typhus fever is always present in this country; and just as typhus fever every few years assumes an epidemic form, so in Bengal, at certain intervals cholera takes on this character, and it is only at these times that it seems capable of a steady march through the rest of the northern half of the world. Now in Lower Bengal are found certain conditions which are supposed to account for the origin of a disease there which the other parts of the globe can only receive but cannot originate; through it a great river finds its way to the ocean by numerous branches; the soil is alluvial; it is so little above the sea level that the tides extend one hundred and forty miles up its rivers, and would, according to competent authorities, submerge the country but for the opposing influence of the vast body of fresh water which meets them, and as a matter of fact, they have, when propelled by a violent storm, broken over it to a distance of one hundred miles inland; over twenty thousand square miles there is nothing but swamp and forest; to the river and the sea is added another source of moisture, the periodic rains, which continue for five months, and are sufficient to saturate every inch of ground. The bodies of the dead are by a large proportion of the population committed to the river to be carried up and down by the ebb and flow of the tide, and the dead of animals as well as every kind of excrement are left exposed on the open ground. The population in many places is dense, and the houses are merely mud cabins, without ventilation, often hidden by jungle, and in the rainy season surrounded by water. On this country for four months in the year the rays of the sun fall almost vertically, and vegetable and reptile life abounds. Amid these conditions cholera is always present, and we have described them because we are convinced that the more closely such conditions are approached in other lands the more favourable do they become for its development.

In Britain, however, our acquaintance with the disease is principally in its epidemic form; now epidemics, as such, have been studied, and it has been asserted that there are certain features, and what is more important, certain causes common to them all. Dr. Southwood Smith endeavours to prove this in the work before us; and mantains that as the black death, and the sweating sickness, and the plague have disappeared from England since land became more extensively cultivated—since some attention has been paid to the sewerage and ventilation of the towns, and since the people have been better supplied with food, clothing, and fuel, and more temperate in their habits—so a perseverance in improving the general condition of the country will ultimately cause the disappearance of the epidemic diseases which in the present century fall upon us. We do not hesitate to admit, with Dr. Smith, that there are many points of resemblance between cholera and other epidemic diseases; but there are also differences between it and them which forbid us applying unreservedly to it conclusions drawn from the observation of these, and we will therefore limit ourselves to the consideration of its features alone.

What circumstances have contributed within the last sixty years to give to it its epidemic character, we do not know. It existed in the East long before. Dr. Macpherson, in his graphic account of the disease in its home, quotes a Portugese and a Dutch physician who described it, the former at Goa, more than three, and the latter, at Java, more than two hundred, years ago. Certain it is, however, that since 1817 it has taken root in Bengal, and has since then, too, shown its capability of spreading through the rest of Asia, and to Europe. M. Bonnafont, indeed, tells us that this has arisen through the misgovernment of the English, who have allowed to go to ruin the splendid reservoirs and tanks in which, under the Mogul princes, were collected, and restrained the waters which now overflow the country; in this we cannot agree with him. Nevertheless a change has taken place in the condition of Lower Bengal; the great tract of marsh and jungle which now harbours only beasts of prey was, three hundred and fifty years ago, well peopled;[a] the change, however, has been caused—not by the neglect of British rulers—but by silting of the sand at the mouth of the rivers, and the impregnation of the soil with saline matter, and its consequent destruction for agricultural purposes.

It has long been maintained that certain atmospheric conditions are necessary to the epidemic spread of cholera. The result of Dr. Macpherson's observations in Calcutta is, that "dry air, with high temperature and wide range of the thermometer, is most favourable to the development of cholera, while moist air, with high temperature and small range, is most unfavourable to it;" he found heavy falls of rain and diminished range of temperature were the most powerful agents in diminishing the prevalence of cholera; the deaths during the three hot months were, according to some of his returns, nearly as numerous as during the other nine. Dr. Morehead, on the other hand, says that his experience does not lead him to the conclusion that cholera has its preference, in India, for particular seasons; and, as he remarks, there always exists in India a temperature sufficiently high to favour atmospheric impurity—so that, if it act in this way, one could not suppose that season would exercise so marked an influence as in Europe. Many Indian medical officers have observed great heat, calmness of the air, and general oppressiveness to precede violent and sudden outbursts of cholera. Both on the continent and in Britain Summer and Autumn have, on the whole, been the seasons of greatest prevalence; but it does not appear, we think, very certain that, during the years when cholera visited us, these seasons presented unusual phenomena as is involved in the idea of an epidemic constitution of the air. According to Mr. Glashier, however:—

> "The three epidemics were attended with a particular state of atmosphere, characterized by a prevalent mist, thin in high places, dense in low. During the height of the epidemic, in all cases, the reading of the barometer was remarkably high, the atmosphere thick; and in 1849 and 1854 the temperature above its average. A total absence of rain, and a stillness of air amounting almost to calm, accompanied the progress of the disease on each occasion. In places near the river, the night temperatures

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[a] De Barros, quoted by Sir R. Martin.

were high, with small diurnal range, with a dense torpid mist and air charged with the many impurities arising from the exhalations of the Thames, and adjoining marshes; a deficiency of electricity, and, as shown in 1854, a total absence of ozone, most probably destroyed by the decomposition of the organic matter with which the air in these situations is so strongly charged.

"'In both 1849 and 1854, the first decline of the disease was marked by a decrease in the readings of the barometer, and in the temperature of the air and water; the air, which previously had for a long time continued calm, was succeeded by a strong S.W. wind, which soon dissipated the former stagnant and poisonous atmosphere.'"

As to the recent outbreak at Marseilles, the evidence is conflicting. According to M. Didiot, the Winter of 1864–5 was moist and mild, the Spring very warm; from the 26th May, he began to observe cases of cholerine, but true cholera was not officially recognized till 23rd July; during that and the two following months, the heat was excessive, the barometric pressure comparatively feeble, but liable to sudden variations, much thunder and lightning, and a southern wind. In September the temperature became oppressive, and the usual rains did not fall, and the epidemic continued; in October, however, the temperature fell, and east winds with rain set in, and the epidemic began to decline.[a]

The observation of other phenomena, however, besides the meteorological, yields support to the idea that there exists an epidemic constitution of the air. Dr. Southwood Smith say:—

"4. Epidemics resemble each other in giving distinct and unmistakable warnings of their approach. These warnings consist of two events: first, the sudden outbreak and general spread of some milder epidemic; and, secondly, the transformation of ordinary diseases into diseases of a new type, more or less resembling the character of the extraordinary disease at hand.

"It is a very singular fact that both in the middle ages, and in modern times, the lesser Epidemic which has generally preceded and preannounced the coming of the greater, is Influenza.

"The history of European Epidemics from the 14th century downwards, shows that whenever a new Plague was at hand, destined to become truly European, it was preceded by a sudden outbreak of Influenza, as general as it was violent. This is exemplified with singular uniformity in the Epidemics of the 16th century—the severest epidemic period on record. It is most remarkable that in our own day the first visitation of Epidemic Cholera was preceded by an outbreak of Influenza which resembled, in the most minute particulars, the violent and universal Influenza that ushered in the mortal Sweating Sickness Epidemic of 1517.

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[a] L'Union Medicale, 22 Mai, 1866.

"So again, on the second visitation of Cholera, in 1848, it was preceded, as we have just seen, by the universal Influenza of 1847.[a]

"The second circumstance, and the most instructive one, premonitory of the advent of a great Epidemic, is a general transformation of the type of ordinary diseases into the characteristic type of the approaching pestilence. Sydenham gives a graphic description of such a transformation in the character of the fevers and inflammatory diseases prevailing in London some months before the outbreak of the Great Plague. He states that this change consisted in an approximation, in several striking features, of the general type of disease, to the distinguishing characters of the Pestilence which had not yet appeared, but was close at hand.

"In 1831, in the wards of the London Fever Hospital, I observed and recorded a precisely similar change in the general type of the Fevers in London, six months before the first visitation of Cholera. Anterior to that period, fever in London, for a long series of years, had been essentially an acute, inflammatory disease, for which blood-letting and other depleting remedies were indispensable. At this period it ceased to be an inflammatory disease; it became a disease of debility, in which no one could think of bleeding; and so closely did the prevailing fever now put on the general character of the approaching plague, which was yet six months distant, that the fever into which those Cholera patients fell, who were not killed by the first stroke—the consecutive fever, as it was afterwards called—could not be distinguished from the primary fever in the wards of the Hospital when Cholera was at its height, which had appeared there for the first time six months previously, and which has never disappeared since.[b]

"It is further very remarkable that the Professors of Veterinary Medicine and Surgery in London noted at the same time a similar change in the type of the diseases of the lower animals—horses, cows, sheep, and all domestic creatures;—a change requiring a similar modification of the remedies which they had been in the habit of using."

The majority of French physicians seem indisposed to admit the existence of a peculiar epidemic constitution of the air. M.

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[a] It may be remarked that for some time prior to the Cattle Plague in the Autumn of 1865, the disease called *pleuro-pneumonia* had extensively prevailed among the herds throughout the country.—[Ed.]

[b] This was written in November, 1865.

Tueffard says:—"It is pretended that the Indian pestilence imprints its character upon all the affections which appear at the same time, but numerous facts, observed with attention, appear to me to demonstrate the contrary; thus, the village of Erincourt suffered cruelly from an epidemic of very severe dysentery without admixture with cholera at a time when all the neighbouring localities were ravaged by the Asiatic collapse." In the same number of *L'Union Medicale*, M. Pellarin[a] states that, although during the Summer of 1865 diarrhea prevailed, as it always does, in very hot and dry Summers in Paris; it did not present any features which would justify us in considering it a diluted product of the epidemic cause; and in the number for October 7th, he informs us that he had charge of a garrison of sixteen hundred men in 1849 at Givet, while the cholera was pursuing its course in several towns in his immediate neighbourhood, and that up to the night when the disease in its pronounced form appeared among the men, there was nothing in their health to show its approach.

The former of those authors, in the article from which we have quoted, thus sums up the difficulties in admitting the existence of an epidemic constitution:—"How can we admit that constitution, which implies the idea of a general influence, could be so different in places very close to one another, that it multiplies its victims in one side of a street, while it entirely respects the other? How could we explain that it only arrives in a locality after being exhausted, or almost so, in another which is distant? Why does it spare the intermediate places? Why does it leap over great spaces? Why does it follow by preference the lines of travel? Who can conceive that a medical constitution which set out from India, could have fallen upon us tardily in the middle of a course which lasts several years."

What evidence as to the portability of cholera is afforded by the recent epidemic? Annually Mahommedan pilgrims in great numbers visit Mecca and Medina, and it is now believed that cholera always appears among them. Last year was one of special importance in their calendar; and from all countries, where the faith of Islam prevails, unprecedented numbers flocked to the Holy Cities. Facilities which they had never before possessed were given them by English and French companies, by these from India, and even more distant portions of the East, crowds of worshippers were brought; those coming from the West, from Turkey and Syria, had to pass through Egypt; from thence two routes were open to them, the old one through the Desert, and the new one by the Red Sea. It is said that 200,000 assembled at Mecca, and that more than a million of camels and sheep were sacrificially slaughtered; every species of filth and the bodies of these animals were left exposed to a burning sun. The pilgrims themselves were exhausted by the privations and fatigues of the journey. Cholera appeared among them in the beginning of May, whether it had come with the Indian pilgrims, or not, cannot be known; a vast number, variously estimated from twenty to 100,000, died around the Holy Cities; and now they set out on their homeward journey. It is thought that if they had been shut up to the old route through the Desert, they might in the course of their long journey have lost it, but they crowded into the steamers and were carried to Suez. The first returning steamer reached Suez on the 19th May; some of her passengers had died during the voyage; on the 21st, the Captain and his wife died; from that date to the 1st of June, about 20,000 pilgrims were disembarked and carried rapidly by rail through Egypt to Alxandria, a city surrounded by conditions very closely approaching those of Lower Bengal; here, near the great Mahmoudieh canal they formed an encampment. It is said that the stagnant water-courses of the Delta were at this time rendered specially offensive by the carcases of the animals which the murrain of the previous Winter had carried off. On the 2nd of June a man, who worked near the sluices of the canal, died of cholera. On the 5th there were two deaths. On the 12th the disease was officially declared epidemic, To any one who has seen the flags of all nations in the harbour of Alexandria, it will be evident that if cholera is portable, no spot could afford greater facilities for its diffusion; and so it was at Constantinople on the 28th of June, at Ancona on the 15th of July, at Trieste on the 25th; into the details of its arrival at these places we cannot enter. Between Alexandria and Marseilles there is constant intercourse, and a case of cholera occurred there on the 28th June. A report of the outbreak has been drawn up by Dr. G. Buisson, and though some of his conclusions, and even some of the facts have been questioned, the report has been adopted by the Medical Society of the city. He says:—

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[a] L'Union Medicale, 3 Octobre, 1865.

"Although the medical constitution of May and June was characterized by an extreme rarity of diarrhea, the presence of a crowd of men of exotic physiognomy and strange costumes, brought the news of the ravages which cholera was making at Alexandria and at Cairo." "The first patients received into the civil hospital were all, without exception, sailors and strangers—the sailors did not necessarily belong to a ship coming from an infected country; they were, for the most part, men of all countries, who had been in the port fifteen or twenty days. At this period of the epidemic in Marseilles the cases of cholera were generally hatched in the docks or the streets near the docks."

The conclusions of the report, in so far as they refer to our present question, are these:—

"The cholera which burst upon Marseilles in 1865 was brought from Alexandria. Good quarantine measures, rigorously administered, would have been able to hinder the importation of the malady."[a]

With these conclusions, on the whole, we are disposed to agree; the weight of evidence collected during previous visitations tends in the same direction; communication is now so rapid and constant that we could hardly expect to find an outbreak of cholera anywhere, the origin of which, through human intercourse, is not, at least, possible; that it may sometimes travel by other means has, we think, been proved by the outbreak in the island of St. Kilda during a former period of prevalence.

Some, then, think an epidemic constitution is the parent of cholera, some that its seeds are carried by human intercourse; while others, again, believe that even though its germs are so carried, they are inoperative unless the favouring atmospheric conditions are also present; but of still greater practical importance than either, is the consideration of those conditions to which the term localizing causes has been applied.

Not only have regiments lost cholera by moving their camp, not only have persons with cholera on them arrived in cities and died there without the disease spreading; but even in cases where it does become epidemic there is the greatest difference between the rapidity of its diffusion; it had extended so widely in Alexandria in ten days that the government were obliged to take official notice of it; while at Marseilles, though the first case occurred on the 28th of June it was not till the 1st of August that it began to prevail alarmingly; and it never there reached the proportions it did at Alexandria and Constantinople. We will enumerate some of the circumstances which seem thus to influence its spread with such proofs as we possess of their power.

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[a] L'Union Medicale, Mai 22, 1866.

We are anxious that our readers should have a well-founded conviction of the potency of these influences; such a conviction as spreading from them to the general public may have a practical result.

Foremost among them appears to be the presence in the air of fecal impurities; the atmosphere may be loaded with much that is offensive without apparently strongly influencing the disease: it is only where there are excrementitious impurities that the effect is marked; this subject was laboriously investigated by Dr E. H. Greenhow, from whose valuable paper in the *British and Foreign Medico-Chirurgical Review* for April, 1851, we make the following extract, because it deals with facts, and because it points out in detail the various modes by which contamination of the air may arise.

"We have personally taken much pains to investigate the precise conditions which, from their more uniform co-existence with it, might be supposed to produce or to aggravate epidemics of cholera. The result of our observations has been that an atmosphere impregnated with the products of fermenting excrement is at once the most obvious and most constant concomitant of cholera. These exhalations were often found, even in a concentrated form, in houses where the existence of any palpable cause of insalubrity would scarcely be suspected, and thus the fact that the pestilence sometimes passing over slums and rookeries, knocked at the door of the comfortable annuitant or the wealthy tradesman, is readily explicable. During the epidemic of 1854, in a portion of the parishes of Chelsea, and of St. Saviour's, and St. George's, Southwark, exclusive of cases in which the notes made at the time of inspection are not explicit, we personally examined into the sanitary state of the houses occupied by 392 families, in whom deaths from cholera had occurred. Out of 2,701 persons 616 had cholera, besides 871 cases of diarrhea. Four hundred and fifty of the cholera cases proved fatal. The inquiry extended alike to the dwellings of wealthy residents in good streets, as to those of lodgers in the most overcrowded and filthiest alley. Without devoting more space to the subject than we can afford, it would be impossible to convey the evidence in its fulness as it came before us, and tested as it was in every manner that we could think of, but an analysis of the numbers above given shows that the existence of the products of the peculiar decomposition alluded to were evident to the senses at the time of visit in 213 houses. In nineteen of these there were cesspools situated either below the house itself, or in such close proximity thereto that the soil had percolated through into the subsoil below the dwelling. In 220 cases, open privies were either erected against the main wall of the house, or so near to the back entrance as to allow of the emanations from the soil being observable within doors. In seventy-seven instances branch drains of imperfect construction, having direct communication with the common sewer, passed underneath houses; or a foul, open ditch; the main-sewer, or a principal branch, in a ruinous condition, was so near to the house as to influence its internal atmosphere. In ninety-two of the houses were untrapped sinks or drains, connected directly with the street sewer, by which the foul sewer exhalations were conveyed to the internal atmosphere. Of the entire number of houses, in only thirty-three were no sources of this atmospheric contamination detected. Not to dilate further upon the precise manner in which the air breathed by the inmates became corrupted with this foul impurity, let it suffice that persons appeared to suffer in proportion to the contamination of the air they breathed by the "privy odour," and that immunity from this appeared to secure immunity from cholera. Strong confirmation of the opinion that the effluvia from decomposing cesspool soil are capable of inducing diarrhea, is also afforded by a fact which came under our observation in the Summer of 1855. Being requested by the General Board of Health to investigate certain alleged outbreaks of choleraic disease in the metropolis, we found that there had been a general outburst of diarrhea in three or four contiguous streets of Bethnal-green, shortly after the opening of the ground for the construction of sewers, and the consequent disturbance of several cesspools. Whilst the upturned soil was exposed to the air, the atmosphere of the affected streets, never remarkable for its fragrancy, was excessively offensive, and to this cause the prevalence of diarrhea was attributed, both by the residents and by several official visitors of the district; an opinion much strengthened by the disappearance of the disease as soon as the work was completed, and likewise by entire immunity from similar disease enjoyed by the inhabitants of surrounding streets precisely the same in character to those affected, but in which there had been no disturbance of the soil."

Several considerations also go to prove that the great liability of low lying districts to cholera, as pointed out by Dr. Farr in his report on the Epidemic of 1848–49, finds its explanation in their more frequent contamination by local impurities.

The influence of the use of water rendered impure by contamination with sewage and with saline matter, was, owing to the opinions brought forward by the late Dr. Snow, subjected by the General Board of Health to an investigation which possesses the weight of a crucial experiment, both on account of the care bestowed upon it, and the number of persons from whose cases the conclusions were drawn. These persons lived in the same neighbourhood, were in the same position, and of the same habits in every respect but one; some of them drank water supplied by the Southwark and Vauxhall Company, others that supplied by the Lambeth Company. Now during the epidemic of 1848-49 both these companies were pumping an impure water; and there died among the tenants of the Southwark and Vauxhall Company 118 persons in every 10,000. The Lambeth water was still more impure, and there died among those receiving it 125 in 10,000. When the visitation of 1854 came the supply of the Southwark and Vauxhall Company had become even worse, and though the epidemic was on the whole a milder one than the preceding, the mortality among their tenants increased to 130 in 10,000. On the other hand, the Lambeth Company were now giving tolerably pure water, and their mortality fell to 37 in 10,000.[a]

The influence of overcrowding in intensifying the cholera poison has been equally proved to demonstration.

> "In the workhouse of Taunton there were 276 inmates. In some of the rooms the breathing space was not more than sixty-eight cubic feet. Cholera swept away 60 of these inhabitants in less than a week.
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> "In the county jail of this same town, the breathing space allowed to each prisoner ranges from 819 to 935 cubic feet. Not a single case of cholera, nor even of diarrhea, occurred among the prisoners in this jail.
>
> "The town's people also escaped, while in the overcrowded workhouses, 22 per cent of the total number of the inhabitants were swept away.
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> "In the village of East Farleigh, near Maidstone, 1,000 persons were assembled for hop-picking. They were lodged in sheds, and had about eighty cubic feet for breathing space; in a few days diarrhea became universal among them; ninety-seven were attacked with cholera, and forty-six died. In the same village, at the same time, under another employer who had provided proper accommodation for his labourers, there was a complete immunity from the epidemic."[b]

These three—impure air, impure water, and over-crowding—seem in civil life, at least, the conditions which most contribute to the diffusion of cholera, and they are the ones to the removal of which we may with most hope of success address ourselves; other influences, though less susceptible of proof, are doubtless not without effect—fatigue, mental depression, intemperance, bad food, or the want of good food, prolonged exposure to the sun or to chills at night, have each appeared to contribute as causes of individual predisposition to the spread of the epidemic. Impure air and overcrowding do not seem to act, as has been sometimes supposed, on the persons, by weakening their power of resistance, but on the disease, by favouring the multiplication of its germs, for it has been noticed that persons coming suddenly within their sphere are specially liable to be attacked; new arrivals and travellers, Dr. Macpherson tells us, form a considerable proportion of the attacked in Calcutta. Whether previous ill-health prodisposes has been doubted. Professor Alison[a] considered the phthisical and other invalids in whom a febrile action existed were little liable to cholera; but M. Mesnet[b] mentions phthisis as existing in several of his cases. In other French reports pregnancy and the debility of convalescence from acute rheumatism are specially alluded to as predisposing conditions; among the insane in asylums the ravages from cholera have generally been great.

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[a] See Dr. Greenhow's Paper, B. & F. Medico-Chir. Review, Jan., 1857.

[b] Dr. S. Smith, *op. cit.*

We have spoken of cholera as portable, we have avoided calling it contagious; we find in the French reports, especially those by M. Pellarin,[c] M. Foissac,[d] and M. Bucquoy,[e] many striking examples of the disease appearing in localities, previously free from it, immediately after the arrival of a person affected with the disease, in its grave form, or with choleraic diarrhea, and in one case after the arrival of a man from a village where it was raging, though he himself remained in good health;[f] and we find that the first case in these instances occurred in the houses where the contaminated had been received. Professor Alison[g] records a case where it was clearly to be traced to the importation of the clothes of a person which had died of it. In the Report of the India Cholera Commission of 1861,[h] it is recorded that a district, lying within the Himalayas, isolated by every natural boundary, was invaded by cholera immediately on the return of some natives to it from the plains below; we cannot, therefore, avoid the conclusion that

[a] Brit. and For. Med. Chir. Review, January, 1854.

[b] Archives. Générales de Médecine, Fevrier, 1866.

[c] L'Union Medicale, Oct. 7, 1865.

[d] L'Union Medicale, Oct. 31, 1865.

[e] L'Union Medicale, Nov. 28, 1865.

[f] L'Union Medicale, Oct. 3, 1865.

[g] Brit. and For. M. C. Rev., Jan. 1854.

[h] Quoted by Goodeve, in System of Medicine.

cholera is portable; but if we be asked whether cholera—*when prevailing in a city*—is more liable to attack those who are brought into contact with the sick than those who are not, we are not prepared to say that it is. Morehead,[a] Macpherson,[b] and Goodeve,[c] all eminent and observant physicians, who have lived among cholera cases, state, as the result of their own observations, that its contagious power must be feeble. In the great Indian epidemic of 1861, not a single medical officer, and few of the hospital establishments, were attacked—a record very different to that left by an epidemic of typhus in Ireland. "It does not appear," says Professor Clarke,[d] "that physicians who are attending cholera patients are more liable to the disease than others; indeed, physicians seem to possess more than usual immunity. The number who have died in this city, in the various epidemics, is small. I have no statistics at hand to guide me, but I am confident that the percentage of mortality is less than among persons in the same social rank unconnected with the profession." On the whole, however, we think that the records of past epidemics here, and of the present one in France, have tended to show the somewhat greater liability to attack of these brought into contact with the sick, especially if not scrupulous as to cleanliness, or overpowered by fatigue, or other cause.

We have heard it stated, though we cannot at this moment remember our authority, that in one of the epidemics in Edinburgh, the nurses in the cholera ward were attacked quite out of proportion to those in other wards; on investigation it was found that feeling the depression of alarm, and having an almost unlimited supply of brandy for the patients, they had used it intemperately themselves: means were taken to prevent this, and their special liability was no longer observed.

The interest of Dr. George Johnson's work lies in the views of the pathology of cholera which he advances; his character as a scientific and accomplished physician, and the valuable additions which he has already made to our knowledge, entitle any opinions he may bring forward to our most careful consideration. Those he holds on cholera are in some respects not new, but have never been so fully developed nor so powerfully supported. The commonly-received theory of the action of the cholera poison is so clearly stated by Dr. Macpherson, that we gladly adopt his words:—

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[a] Diseases of India, first ed., Vol. i., p. 367.

[b] *Op. cit.*, pp. 20-21.

[c] *Op. cit.*

[d] New York Medical Record, May 15, 1866.

> "The most characteristic symptom of cholera without doubt is the immense evacuation of fluids from the alimentary canal. This liquid was supposed to be analogous to the serum of the blood; and whether it was or was not so, it was easy to see how the blood, deprived of its water, circulates badly and ends in stagnating, not only in the capillaries, but by degrees in the large vascular trunks: thence the cutaneous cyanosis. To repair the loss of fluids by the blood, there is a general imbibition from all the tissues and structures, which end in draining themselves; the result of which is a rapid shrinking of the parts observed, especially in the fingers, nose, and about the eyes. Absorption, and the functions of the secreting organs, are suspended from the want of water, which is indicated by the intense thirst of the patients, and their demands for water. The pulmonary capillaries no longer admit a blood that has become too thick to circulate easily in them: hence their bloodless state; hence also the black colour of the arterial blood, which has not been aërated, the expired air containing more than the usual amount of oxygen, which was therefore not absorbed and converted into carbonic acid, as under ordinary circumstances.—(Davy, Rayer, Twining.) The imperfect aëration of the blood explained the defective calorification and the cold that resulted from it. The absence of blood from the lungs and the imperfect aëration, accounted for the feeling of suffocation in the more advanced stages, and the feebleness of the voice was probably caused by the weakness of the respiratory organs, which are not able to pass into the larynx a column of air strong enough to produce the natural voice."

According, then, to the most generally-received opinion, increased discharge from the gastro-intestinal mucous membrane is the most important morbid result, since through it are produced the remaining symptoms; and however varied in their details, the arrest of this discharge is the object aimed at by almost every method of treatment—the theory and the practice are alike disputed by Dr. Johnson; the grounds on which he questions them are explained with a perspicuity to which no summary of his views can do justice; but his argument may be thus stated:—It is the testimony of the most competent observers that the degree of choleraic collapse, its intensity and fatality, is not proportioned to the amount of vomiting and purging; the phenomena of collapse, when analyzed, are very different to those of syncope from loss of blood or its constituents. The effects which have followed venesection in many cases of collapse, and the fact that in the majority of cases vomiting and purging still continue when the collapse is passing off, disprove the idea that it is due to the draining away of the serous portion of the blood. Moreover, according to our author, the statistics of his treatment by castor oil during the epidemic of 1854 go to show that arrest of the disease in its preliminary stage was constant, and recovery from it is at least as frequent as under other methods of treatment—results clearly incompatible with the commonly-received notion; it is certain that the cholera stools contain some poisonous material; therefore we are justified in inferring that just as the virus of small-pox escapes through the skin, so that of cholera seeks its exit by the gastro-intestinal tract. The symptoms during life and the appearances found after death—distention of the venæ cavæ, of the right side of the heart, and of the pulmonary artery and its branches, comparative emptiness of the pulmonary capillaries, pulmonary veins, left cavities, aorta, and arterial system generally—justify the conclusion that "during the state of collapse, the passage of blood through the lungs, from the right to the left side of the heart is, in a greater or less degree, impeded." "I believe the true explanation of the arrest of blood in the lungs to be this. The blood contains a poison whose irritant action upon the muscular tissue is shown by the painful cramps which it occasions; the blood thus poisoned excites contraction of the muscular walls of the minute pulmonary arteries, the effect of which is to diminish, and in fatal cases entirely to arrest, the flow of blood through the lungs." The purging is an effort of nature to eliminate the poison; we should, perhaps, encourage it, or at least give medicine to cause the bowels to expel the peccant matters thrown out from the mucous membrane; certainly we should not attempt to restrain it; the smaller percentage of deaths during the earlier Indian epidemics has been attributed to the malady being then milder in its action. Dr. Johnson is inclined to attribute it rather to the use at that time of purgatives in the treatment—this is the main line of argument by which his theory is supported; but many interesting details are brought to its defence, for which we must refer to his work.

Now we are convinced that the propriety of the treatment founded on these views can only be settled by experiment, and, to a considerable extent, the results of treatment will influence our belief in the theory; much can be advanced in its favour and much can be urged against it; in medical reasoning we are obliged to assume as strictly accurate facts many things which are only approximately such; in the present state of our science we can seldom go beyond predicting what is probable; we do not know all the conditions of any pathological process so thoroughly as to be able to do more; to experience, and to experience alone, our appeal must lie. According to Dr. Johnson satisfactory results have followed the use of castor oil. The Treatment Committee of the General Board of Health, in their report, state the mortality under the use of eliminants was higher than under any other plan of treatment. On the other hand, many of the French physicians arrived at the conclusion, in the last epidemic, that it was judicious to commence the treatment by an ipecacuan emetic, and, in the children's wards, under the direction of M. Barthez, it was found desirable, unless the tongue was clean, to give both an emetic and a purgative dose of sulphate of soda before stimulants and astringents.

Closely connected with this is the question of premonitory diarrhea. Does it frequently exist? Is its neglect followed by the supervention of the algide symptoms? Certainly the majority of those who have written on previous epidemics, have strongly insisted that this is the case. A correspondent in the *Medical Times and Gazette*, for July 14, of this year, furnishes us with some testimony, afforded by the recent severe outbreak at Amiens.

"On one point all were unanimous—that in the great majority of cases the cholera was preceded by diarrhea; that this diarrhea, if continued, would lead to the algide cholera, and that it must be suppressed." M. Barth, as quoted by Prosper de Pietrá Santa, in his report to the Medico-Chirurgical Society of Paris,[a] among cases treated at the Hotel Dieu, concluded that in 95 in every 100 cases the attack commenced with looseness of the bowels, and in 75 of these the looseness preceded the other symptoms by an interval varying from one to eight days. We will presently give a description of this premonitory diarrhea, which we have carefully condensed from an elaborate paper on the subject, by M. Chauffard, in which its relation to the algide symptoms and its treatment are stated in a manner which we think would be concurred in by the majority of French physicians who have seen much of the present epidemic. As to its great frequency he expresses himself positively. It is true, as Dr. Johnson states, that some of the worst cases died with little vomiting or purging, but, as has been pointed out by Professor

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[a] L'Union Medicale, Mai 24, 1866.

Flint,[a] this is not incompatible with the assumption that transudation from the mucous membrane may have contributed to the fatal result, though it has never been passed out of the canal by vomiting or purging; fluid, in quantity, may, nevertheless, have been effused and lost to the blood; or we may suppose that in some cases, though the water effused may be small in quantity, it may have carried with it very important constituents of the blood, while, lastly, to some persons a small loss may prove as injurious as a copious discharge would be to others.

Professor Clark,[b] in the second of a course of lectures on cholera, which he has been delivering in New York, throws some doubt upon the anatomical facts, on which Dr. Johnson's theory rests; but we think there can be no question that the majority of the best observers have described the lungs as singularly bloodless, and the right cavities of the heart and the pulmonary artery as distended with blood. Arrest then takes place in the smaller branches of the pulmonary artery, if we consider that inspissation of the blood does not sufficiently account for this we must believe it arises from spasm of the muscular fibres produced by such an alteration in the blood as renders it irritating; but whether this is brought about directly by the action of the cholera poison on the circulating fluid itself, or is a secondary result of the intestinal flux, is quite an open question. The cramps, Dr. Johnson thinks, show the irritant effects of the cholera poison on the muscular tissue; such may be their mode of production, but they occur in other diseases affecting the gastro-intestinal tract, notably in irritant poisoning, and may, it appears to us, be with equal reason referred to some form of reflex action.

One of the arguments, which we think Dr. Johnson puts most forcibly, is that, since neither in their symptoms, nor in the effect of remedies upon them are hemorrhagic syncope and choleraic collapse alike, the latter cannot be due to the draining away of serum; on this, Flint, in the paper already quoted, well observes that diminution of the quantity of the circulating fluid, and profound alteration in its constitution, from the loss of certain of its elements, are such different conditions that we should not look for any resemblance between them, and to deny that collapse is due to loss of serum, and the constituents which drain away with it, because it does not produce the same symptoms as hemorrhage is illogical.

The effect which has not unfrequently followed venesection in cholera is adduced by Dr. Johnson in support of his views; on this point opinions are conflicting, and we gladly quote Dr. Macpherson's experience, particularly as we think it is a remedy which should not be quite forgotten.

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[a] New York Medical Record, May 1, 1866.

[b] The Medical Record, New York, April 2, 1866.

> "When I arrived in India in 1840 I found venesection was the common practice in Calcutta; and in an epidemic in 1842 I gave it a fair trial in a good many cases which I had pretty completely under my own observation. In some cases, even when the pulse was not quite gone, only a few drops, or at most an ounce or two, could be got to flow. All such cases, and even one in which I got eight ounces, died. In other cases, when venesection was tried early and blood flowed freely, there was an immediate feeling of relief about the precordia, the action on vomiting, or purging, or cramps, being however uncertain. No case in which blood flowed readily died; but then it is to be remembered that venesection was not the only remedy employed, and that, if blood flowed freely, the case was one that had come early under treatment. Still, the general result was, that bloodletting before the pulse was gone, and still more while the pulse was good, was a valuable remedy. I also found that blood-letting was better adapted for the European than for the native constitution. In all this I was arriving at the same conclusions as Mr. Jameson, showing that, in the course of twenty-five years, there was no material change in the effects produced by blood-letting. It must be remembered of this, as of other remedies, that their applicability depends much on the character of the particular epidemic, blood-letting being most useful where the disease sets in most rapidly with threatening of collapse: most applicable to the cases of strong healthy men; not at all so to those of men already reduced by previous disease. In spite, however, of no actual dissatisfaction with the results of this experiment, I gradually gave up bleeding. Its employment requires much discrimination. If employed too late it is a depressing agent—that is, if blood be got to flow. On the whole, we do better to avoid it, although it is worth trying in cases where it is too late to attempt much by mere medicines."

We attach little weight to the argument, that vomiting and purging, being efforts of nature, should be respected. We cannot agree with a recent reviewer of Dr. Johnson's work, who ridicules the idea of curative efforts of nature. It is true our notions on this subject are vague, and we think that of late years there has been a disposition to view certain portions of morbid processes too readily as curative efforts. All we know is this, that in certain diseases, changes in function, and even in structure, supervene, changes which, if they occurred, *per se*, in a healthy person, would be prejudicial;

but, occurring in the course of disease, leave the patient better off than he was before; experience has taught us that a too ready interference with these changes is not for the good of the patient; if, as a matter of clinical experience, it is found that choleraic patients, in whom the vomiting and purging are encouraged, get on better than those in whom they are restrained, we will admit that they are curative; but let us not approach the subject with the preconceived notion that, being natural efforts, they must be curative.

Moreover, admitting, as we are prepared to do, that the cholera stools contain a poisonous matter, it by no means follows that the removal of this poisonous matter becomes so urgent an indication as to call for its assistance by medicines which promote vomiting and purging, which Dr. Johnson himself admits, may sometimes by their violence lead to death by exhaustion. The researches of Thiersch and Pettenkofer, render it probable that choleraic discharges are not noxious till they have undergone some change, for which atmospheric air, or the influence of contact with the soil is necessary; and if, as Dr. Johnson maintains, the analogy between small-pox and cholera is so close, there is surely no need to be so anxious to carry off the discharges, if, like the variolous matter, they are poisonous, they are not so to the patient who is already affected, but to the healthy.

As we have already said, we think the intelligent observation of cases can alone decide the propriety of the eliminative treatment; and should London unfortunately suffer, if, while the epidemic is at its height, this method is tried at King's College Hospital, we will await the result with anxiety, for we are convinced it will be fairly and impartially reported on by the distinguished physician who has so strongly recommended it. We have offered these criticisms on the theory, because the arguments in its favour have been so powerfully put by Dr. Johnson that the possibility of fallacy in his reasoning is not at first sight apparent.

Even those who may not consider themselves justified in departing so far from the orthodox treatment as to make trial of the eliminative method can assist in observing facts which bear upon the theory on which it is founded. Let it be carefully observed whether, in the majority of cases, the rapidity and depth of the collapse bears any proportion to the amount and character of the stools, and whether after death, *in the state of collapse*, the condition of the heart and lungs are such as Dr. Johnson has described. There is one other consideration which we think tends to strengthen the generally received opinion of the gastro-intestinal loss being the cause of many of the other symptoms. It has always been surmised that in cholera there is a profound alteration in the blood, which leads to the arrest of circulation and respiration. During the last European epidemic, an attempt was made to determine the actual nature of this change, and the result went to show that it was such a change as would presumably follow the unique flux which marks the disease. Schmidt made a series of examinations of the blood, an account of which was published in the Report drawn up by Dr. Baly and Dr. Gull, and also in a review of that Report, by Dr. Parkes, in the *Medico-Chirurgical Review*, for July, 1854:—

"In the transudation of cholera (a period of short duration = 36 hours, *Schmidt*), the intercellular fluid of the blood (*i. e.* serum and fibrine) is first affected, and water, salts, and a small portion of albumen pass off, and form the well known liquid stools.

"The order in which the constituents of the serum are affected is thus laid down by Schmidt. The water transudes before the solids of the serum; the inorganic before the organic solids; the chlorides before the phosphates; the salts of soda before the salts of potash. The causes of this order of transudation are as little known as the cause of the transudation itself; but it is interesting to observe that the order is very much the same as takes place during the action of some purgative medicines, as elaterium.

"Very soon after the transudation of some of the constituents of the serum commences, an important change occurs in the blood; the normal diffusion-currents between the fluids in the blood-cells and around them alter; and the constituents of the blood-cells transude into the serum in the same order as the constituents of the serum transude into the alimentary canal; that is to say, the water diffuses more readily than the solids; the inorganic solids more readily than the organic; the chlorides, and of these the soda salts, more readily than the phosphates. The result is, that at the height of the transudation period, the constitution of the blood is profoundly altered. Of course the percentage of the organic constituents (which pass off with so much difficulty) is enormously augmented; it is probable that their composition must have undergone alteration, but of this nothing is known. The inorganic constituents of the blood, if compared to the water, are at first (during the first four hours), increased, because at this time the water is passing off with great rapidity; afterwards, as the salts pass off, the disproportion is lessened, and after eighteen hours, the proportion of salts is greatly diminished, and if compared with the organic constituents, the diminution is enormous. With respect to the individual salts, there is in the blood a relative preponderance of phosphates over chlorides, and of potash salts over soda salts. This follows, indeed, as a matter of course, if the formula for the order of transudation already given, be correct."[a]

With these results before us, it becomes difficult to resist the conclusion that the first step in the process is the transudation from the blood into the intestinal canal. The liquor sanguinis of the blood loses certain of its elements, and in virtue of the laws which operate in complex fluids, these elements are supplied from the corpuscles which float within that liquor sanguinis, thus altering the constitution of the whole, and rendering it difficult of circulation, as well as unfit to subserve respiration and calorification.

In Dr. Morehead's work[b] we find a case which we think is not without interest in this connexion. A patient was admitted to the Bombay Hospital, with effusion into the left pleural cavity and into the peritoneum, apparently connected with renal disease; he had diarrhea which passed into cholera, after the supervention of which he lived six days, the pulse not being lost till just before death, and coldness of the surface being only an occasional symptom, apparently in consequence of the blood being supplied with serum from the effusions which disappeared during the attack.

There is little doubt that epidemics of cholera, like other epidemics, differ from one another both in violence and in prominence of certain symptoms. Dr. Macpherson[c] specially mentions this, and so does Dr. Wise;[d] that the disease, however, has lost anything of its early intensity is unsupported by facts; Macpherson tells us that it is certainly as great as it was in 1817; from the excellent letters of M. Foissac[e] we learn that the proportion of deaths to attacked has rather increased than decreased; but the proportion of persons attacked to the population in each successive epidemic seems steadily lessening. Prosper de Pietra Santa[f] gives the following as the number of deaths to population in Paris:—

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[a] Brit. & For. Med. Chir. Review, July, 1854, p. 139.

[b] Researches on Disease in India, 1st ed., Vol. 1., p. 397.

[c] *Op. cit.*, p. 11.

[d] *Op. cit.*, p. 8.

[e] L'Union Medicale, Oct. 19, 1865.

[f] L'Union Medicale, Mai 24, 1866.

In 1832 - - -	1 in 40
In 1849 - - -	1 in 51
In 1853-54 - - -	1 in 112
In 1865 - - -	1 in 270

The outbreak in continental towns seem also very clearly to bear out the truth of Dr. Farr's views, that epidemics are self-limited, that they have a period of increase, a climax, and a period of subsidence; on the whole, they also go to show the greater fatality of the seizures in the beginning of the epidemic; this curious fact, however, is stated in the *L'Union Medicale* for October 24, 1865; the rapidly fatal cases (*les cas fondroyants*) were few at the beginning of the epidemic, were frequent in the middle of it, and became less frequent towards its close; the rate of mortality to attacked varies so much in different periods of the epidemic that it is impossible to say what it usually is. At Amiens, when the outbreak was at its height, 60 per cent. of cases presenting algide symptoms died; but at present, according to the correspondent already quoted, 60 per cent. of those recover. In framing statistics, it is important to determine when does the case become true cholera. Dr. Mesnet, Hôpital Saint Antoine, fixes on cramp as the boundary symptom ; in the mildest of the cases reckoned by him as choleraic, there existed epidemic diarrhea, with or without vomiting, well-marked cramps, preceded or followed by debility and *malaise*, and his figures are as follows:—

213 cases (all males).[a] Cured, 126. Died, 87.

Epidemic Diarrhea 29		Cholera Leger 49		Incomplete Collapse 68		Complete Collapse 48		Dying on Admission 19	
Died	Cured	Died	Cured	Died	Cured	Died	Cured	Died	Cured
—	29	7	42	24	44	37	11	19	—

Of these 88 there died:—

In collapse without reaction, - - -	25
In a state of irregular abortive reaction, -	26
Of secondary affections, - - -	13
In a typhoid adynamic state, - - -	6
With cerebral symptoms (*dans l'etat meningitique*), - - - - -	4
By suicide, - - - - -	1
Of disease contracted in hospital, - -	2

[a] Archives Générales de Médécine, Fevrier, 1866.

According to the report of M. Chauffard,[a] already referred to, diarrhea was not unusually prevalent *before* the last epidemic, the first indication of which was true cholera in isolated cases, but *during* the epidemic and in frequency proportionate to the cases of confirmed cholera, he noticed gastro-intestinal ailments in such number that at one time they seemed to constitute the sole sickness of the community—these derangements grouped themselves under four heads.

1. Cases in which there were very frequent serous stools, often with some nausea—except that the secretion of urine continued, and that cramps did not come on—these cases presented all the symptoms of cholera in a mitigated form; they were liable to get worse either gradually or suddenly, and end in death.

2. Cases in which the patient has four or five stools in twenty-four hours, with hardly any feeling of illness, but at the end of two or three days a sudden attack of cholera.

3. Cases presenting the ordinary symptoms of derangement of the stomach (*embarras gastrique*) anorexia, foul tongue, clammy mouth, vertigo, but without fever or headache; these were liable to end suddenly in cholera.

4. Cases in which, after some epigastric distress, perhaps, one or two loose stools and some faintness, coldness and vertigo, profuse viscid sweats break out and recovery takes place.

For all these forms of gastro-intestinal derangement, rest in bed, abstinence from food, an ipecacuan emetic, followed, if necessary, by opium and bismuth, are the means recommended. Opiates and astringents given without being preceded by an emetic he found dangerous, the symptoms often returned and true cholera came on; sometimes the symptoms subsided spontaneously. M. Gibert draws attention to the state of the tongue, as enabling us to diagnose the epidemic diarrhea from looseness of the bowels due to ordinary causes; in the latter it is red, dry, and pointed, whereas in the choleraic form it is always large, pale, moist, white, and covered with mucous layer. By some observers, vertigo was noticed as a frequent symptom. M. Marotte[b] gives it, as the result of his experience, that these cases could not be considered out of danger till some febrile reaction had followed.

We now come to consider the treatment of cholera, in its fully developed form, availing ourselves of such reports of the recent epidemic in France as come from physicians who have had sufficient opportunities of treating the disease, and appear to be able with calmness and sobriety to appreciate the results.

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[a] L'Union Medicale, Oct. 31, 1865.

[b] L'Union Medicale, Oct. 21, 1865.

The Indian authorities—Macpherson, Goodeve, and Morehead—are all unanimous as to the propriety of attempting to check the first symptom of cholera by a full opiate, one to two grains of solid opium, or an equivalent of one of its fluid preparations, which is probably to be preferred; if rejected it is to be repeated, and it is to be followed by small doses of acetate of lead and opium—the combination which in the first epidemic was recommended by Dr. Graves, and which seems to have yet more evidence in its favour than any other; but it had better be given in the fluid form, two to five grains, with a few minims of the solution of morphia, may be administered every hour, or even every half hour; if, after these remedies have been continued for four or six hours, the discharge continue, their inutility is manifest, and they should be abandoned. Our own practice was to give at the outset forty minims of Battley's sedative liquor, half a drachm of spirit of camphor, and the same quantity of sulphuric ether, washed down by a little good brandy and soda-water, instead of the opium above as they advise.

If we may be allowed the expression, it has seemed to us that patients not unfrequently all but recover from cholera—the struggle between the powers of life and the force of the poison is so close that if the former had held out a little longer the patient would have been saved; the same is seen in fever where judicious support during the critical hour saves a patient who, notwithstanding the care which had been bestowed upon him in the early period of the disease, would have succumbed in the end but for this little but all-important assistance; in cholera, however, those who have carefully watched for hours the course of a case must agree with Dr. Johnson that it is vain to seek by quantities of powerful stimulants to keep up the failing powers; there are no means of introducing fresh supplies to the garrison; our only hope is to economise those which are already within: for this reason, it was our habit to beg the patient to restrain, as far as possible, the restless jactitation, which is so distressing a feature of the disease, Often, after the attack has existed some hours, the motions, though frequent and watery, are not profuse, and should be caught on a folded blanket laid under the sufferer; from the first they may be received in a bed-pan, and the exhaustion of rising to stool avoided; in the same way, instead of standing up and leaning over the basin to vomit, the contents of the stomach should be caught in a towel—all efforts to force food, even beef-tea, upon the patient we think injurious; the urgent thirst should be assuaged by small quantities of cold water or iced soda-water; if large quantities are given the vomiting is usually more frequent; cold drinks are generally urgently demanded by the patient, but we have known hot tea prove grateful, and tea, with a little rum or brandy in it, seems a favourite drink with continental physicians. We are not of those who dread stmulants on account of their producing the secondary fever, because there is abundant evidence of secondary fever in cases which have not been treated largely by them. Dr. Macpherson specially mentions this fact; they may, however, aggravate it, and so probably may opiates administered in periodic doses during collapse; equally certain, however, is it, that stimulants do not produce the effect of rousing the patient; the opinion of the best authorities, and our own observations of cases which we never left, except for a few minutes, from the outset of the disease until its close, have convinced us of this, and we mention it because it is difficult to stand at the bedside of a patient in collapse and not feel constrained to pour in stimulants in larger and larger doses; they do not restore heat nor fill the arteries, and the taking of them, and the vomiting of them again, as often happens, distress the patient. Emetics have been recommended in collapse; we have no experience of them; it is possible a rapidly acting, powerful emetic might have a good effect; certainly the teasing sickness which follows injudicious feeding and medication only exhausts the sufferer; a little good brandy, or small quantities of the aromatic spirits of ammonia, may be added to the drink, and if they appear to influence the pulse, *cautiously* continued, against the distressing vomiting, we possess no reliable remedy; fluids, if iced and given in small quantities, often do not return till they have accumulated, so as slightly to distend the stomach; a scruple dose of calomel laid on the tongue and washed down with iced water, has once or twice appeared to us to settle the stomach. Goodeve advises a large sinapism to the epigastrium, and the hypodermic introduction of half a grain of muriate of morphia; a small glass of good (not sweet) champagne is sometimes grateful; the cramps, however, can generally be controlled by friction, with turpentine or chloroform liniment; if severe, Dr. Goodeve advises the inhalation of chloroform, which, if moderate, he says, "may be used even in great debility without increasing the weakness of the pulse." On the continent, very violent means have been recommended for maintaining external warmth, but we doubt whether any are advisable beyond drying the body with a soft warm towel, and laying bags filled with hot sand or hot bottles, near the body; a correspondent in *L'Union Medicale* asserts that repeated injections of very hot chamomile tea, with brandy and lemon juice, thrown high into the bowels were useful in restoring heat; very hot water would probably be quite as efficacious, and is, perhaps, deserving a trial, to it might be added two drachms of Condy's fluid; another correspondent recommends, with much assurance, that the abdomen should be covered with a mixture of collodion (80 parts) and castor oil (20).

Dr. Wise, in his little work, tells us that he has seen the heat kept up in collapse, by applying compression to the femoral artery on one side, and to the brachial on the other; the limb having been first well rubbed from below upwards, so as to favour the return of blood, which the ligature prevents re-entering the extremities. He says it may be kept on for hours, or even for a day or two.

There appears to be some evidence in favour of the use of Condy's fluid. Dr. Howard Montgomery gives the statistics of twenty-three cases, with only one death, in which the treatment consisted of "Condy's disinfecting fluid, internally, stimulants and counter-irritation, and nutrition."[a] Dr. Doyle[b] treated forty-six prisoners, in Cuddalore Jail, with the fluid: half a drachm to a drachm, in water, every half-hour, with brandy, broth, and frictions; but he also gave, at the commencement, two astringent pills; he had only fifteen deaths, which, considering the class of patients, and that they "were all well developed cases of collapsed cholera," we consider a very low death-rate, though greater than in the twenty-three cases in which no astringent was given; five patients who refused the treatment died.

Hot baths have been strongly recommended; and on theoretic grounds they seem such judicious remedies that we think it necessary to tell our readers that two of our most competent observers, Dr. Parkes and M. Mesnet, were satisfied that they were injurious. On the whole, then, in the stage of collapse, we think, there is greater danger of doing too much than too little; there is no disease in which the urgency of the symptoms seems more imperatively to demand energetic treatment, and the temptation

[a] Med. Times and Gaz., March 10th, 1866.

[b] Madras Quarterly Journal of Medical Science, Feb., 1864.

is, indeed, strong to try one remedy after another; painful experience, however, has proved their inefficiency; above all things, then, do not torment the patient with incessant medication, try to keep up the warmth of the body by light blankets and jars, but not so as to oppress; endeavour to relieve cramp; give a little drink when desired—to it may be added brandy or ammonia in small quantities, or Condy's fluid; if it can be done without exhausting the patient the hot enema may be thrown up, and a mustard plaster may be laid over the stomach; but remember that the medicines, which the case seems to require, have already been tried in similar cases, and do not think that by redoubling the dose of the stimulants and increasing the frequency of their administration, by trying first one and then another, that you must succeed—injury, not benefit, is likely to follow such a course.

The treatment of the secondary fever should not, we think, differ in any essential respect from that of any pyrexial state presenting similar symptoms. The officious use of purgatives and mercurials are specially condemned by Dr. Goodeve as liable to cause a relapse; the secretion of urine should be encouraged by counter-irritation to the loins, and the use of the ordinary non-irritant diuretics. Mesnet considers the character of the secondary fever is determined by the idiosyncracy of the individual; cerebral symptoms, especially where they are those of a hyperemic condition of the nervous centres, may be combatted by leeching and blisters. M. Mesnet describes, under the designation of the typhoid state, cases in which somnolence, amounting sometimes to coma, was the prominent symptom, and he thought quinine, fifteen grains in the day, was good; *L'état cérébral méningitique* he applied to a kind of drowsiness from exhaustion. English practitioners have usually attributed head symptoms to uremic poisoning. Gastro-intestinal lesion of the inflammatory kind does not appear to have been observed so often in Europe as in India, where it is treated by fomentation, leeching, and blistering.

In cholera times there are some things which should be done. The general importance of sanitary measures has been so fully pointed out by the zealous and most competent officer of health for this city, and by others, that on them we say nothing; except this, that if the cleansing of sewers and cess-pools is left till cholera is among us the disturbance of the filth will usually do more harm than good.

We think that those who have not the calls of duty to detain them, and specially those who, having no occupation for their minds, are likely to be a prey to fears and fancies, will do well in cholera times to leave a city where it has appeared. They should not go to places at the sea-side, but to elevated situations inland. A shooting lodge on the moors is safer than a town house. There are public and patriotic considerations which ought to prevent some from adopting such a course, though free to do so; but it is, nevertheless, for themselves the wisest. If they go, let them not return till the epidemic has been for some weeks completely over, as arriving freshly within the sphere of its influence they would be exposed to greater risk.

The late Professor Alison pointed out the benefits arising from houses of refuge, where were received the unaffected inmates of overcrowded dwellings in which cholera had appeared, and if the epidemic comes we would urge their establishment. That the congregation of a number of people together, unless with singularly good ventilation, in cholera times, is fraught with danger, is a consideration with which boards of guardians should be made acquainted.

The propriety of moving patients, as soon as the violence of the attack is over, to a separate ward, has been well pointed out by Mesnet as reviving their hopes and saving them from the depressing effects of witnessing, perhaps just as they are coming out of their first sleep, others around them in the agony of cramp and vomiting. We have ourselves seen a patient, a fine athletic man, who had struggled through collapse, and had slept, so terrified by the sight of the intensely rapid death of one of his comrades, who unfortunately occupied the next bed, that he gave himself up, a conviction which was soon realized. That there should be separate wards for cholera cases seems to be the general opinion in France.

Disinfectants should certainly be used in Cholera Hospitals, and in private houses when it appears. Those about the sick will do well to rinse their mouths and wash their hands before eating, with water to which Condy's fluid has been added. Heat above 180 is a powerful disinfectant. We learn from Dr. Mapother's Report that, acting on this fact, means have been provided in Liverpool for exposing the clothes of infected persons to a high dry heat; and in all probability if towels and bed linen are immediately thrown into boiling water any noxious element attaching itself to them will be effectually destroyed. If possible, choleraic vomit and dejections should not be thrown into a common sewer, but should be buried;

in any case means should be taken to destroy any noxious matter contained in them. Common lime (one of the cheapest and best disinfectants), or the chlorinated lime, may be smeared over the inside of the bed-pan. If it seems desirable to let the room become filled with a volatile disinfectant chlorine may be liberated.[a]

Finally, in cholera times we do not think any food which does not disagree under ordinary circumstances should be eschewed. Let meat be fresh and well cooked; let moderation be the rule, not only in eating but in work and in pleasure. Intemperance strongly predisposes to the disease; but we cannot at all concur with those zealous reformers who recommend total abstinence in view of a cholera epidemic. To those who have hitherto indulged too freely such a complete deprivation (though under most circumstances we believe it to be the best course) would, we think, leave them specially liable to the malady; and to persons in feeble health we would recommend the moderate use of good liquor.

Our estimate of the works at the head of this article may be inferred from our references to them. Though we are not able to go quite so far as Dr. Southwood Smith, we recommend his most interesting account of the influence exerted on mortality in England by civilization, to all who have the welfare of the people at heart. Dr. Johnson's volume should be read by all who are likely to see cholera; whether disposed or not to follow his suggestions they will have their attention drawn to the points on which we are in want of accurate and impartial observation. Dr. Macpherson not only gives us a graphic account of the phenomena of cholera in Bengal, but touches with singular terseness and vigour every difficult point in connexion with the disease, and displays an acquaintance with the literature of the subject which does no little credit to one who has been so long exposed to a Chowringhee atmosphere. To Dr. Wise's peculiar treatment we have alluded already. M. Bonnafont thinks that cholera, coming originally from India, would die out *en route* if it did not meet here and there marshy undrained land, from which it is able to draw "de nouveaux éléments de force reproductive." He would, therefore, have the sanitary congress set on foot a plan for every country draining the marshes within it. For the draining of the Delta of the Ganges, on account of its magnitude, he would invite the co-operation of all civilized nations. M. Pellarin's pamphlet is mainly in support of the doctrine of contagion. Of the remaining works the less we say the better.

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[a] "Mix eighteen parts of finely ground common salt, with fifteen parts of *finely pulverized* good binoxide of manganese; put the mixture in a flask, and pour a *completely cooled* mixture of forty-five parts of concentrated sulphuric acid, and twenty-one parts of water upon it, and shake the flask; a uniform and continuous evolution of chlorine gas will soon begin, which, when slackening, may be easily increased again by a *gentle* heat."—*Fresenius.*

Observations on the Functions of the Liver, more especially with Reference to the Formation of the Material known as Amyloid Substance, or Animal Dextrine, and the Ultimate Destination of this Substance in the Animal Economy. By ROBERT M'DONNELL, M.D.; M.R.I.A.; Surgeon to Jervis-street Hospital, Lecturer on Surgery in the Carmichael School of Medicine, Dublin; Fellow of the Royal Medical and Chirurgical Society of London, &c., &c.

Recherches Physiologiques sur la Matiere Amylacée des Tissus, Fœtaux et du Foie. Par M. LE DR. M'DONNELL (Commissaires MM. MILNE EDWARDS, COSTE, CL. BERNARD). Comptes Rendus de l'Academié des Sciences. Tome LX. 8 Mai., 1865. P. 953.[a]

Recherches sur la Substance Amyloide de Quelques Tissus du Fœtus, et sur les Functions du Foie. Par LE DR. M'DONNELL. *Journal de la Physiologie de l'Homme and des Animaux*, &c. Tome VI., p. 554.

THE subject of the above interesting and highly important memoirs, which we propose now briefly to review, has occupied the attention of our author for a considerable period of time. We find the earliest published account of his investigations upon the amyloid substance of the liver in the *Dublin Quarterly Journal of Medical Science* of August, 1859,[b] and at various subsequent dates essays upon the same subject have appeared in the Proceedings of the Royal Irish Academy, the Royal Society, and elsewhere.

In the preface to his late memoir, Dr. M'Donnell puts forward the importance, both theoretical and practical, of his researches, in a fashion so clear, and withal so modest, that we believe we cannot do better than reproduce his own words:—

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[a] See also Vol. lxi., page 533—of same periodical—dated September 25th, 1865, wherein a typographical error, occurring in the article just quoted, is corrected.

[b] On the Physiology of Diabetic Sugar in the Animal Economy.

> "The majority of those engaged in practice, still, I believe, look upon the liver as if the principal duty of this gland was nothing else than the secretion of bile. It is certain, however, that it does other work, little, if at all, inferior in importance to the formation of biliary matters, and quite as necessary to the maintenance of health. Its power of making, and storing up for a time within its cells, a material resembling starch, constitutes, without doubt, one of its most important functions. This no person will for a moment doubt, who takes the trouble of ascertaining, by experiment, the immense increase or diminution in bulk which the liver may be made to undergo in the space of a few days by such changes of diet as increase or diminish the amount of this starch-like material in its tissue.
>
> "The subject is one which I conceive to be of great interest, in a practical point of view; and on this ground I would solicit the attention of practitioners to the *facts* recorded in the following pages, especially those relating to 'The Formation by the Liver of Amyloid Substance' (p. 11, and seq.). While I venture to hope that physiologists will also carefully consider the facts, I must also hope that those who differ from the theoretic view, as to the ultimate destination of the amyloid substance in the animal economy, which I advance in the following pages, will, at least, remember that I do not put forward my view with dogmatism, but as one keenly alive to the difficulties and delicacy of the question at issue."

In order now to present to our readers a *résumé* of Dr. M'Donnell's views, and of the line of argument by which he sustains them, we shall quote freely from his introduction.

> "In March, 1857, Professor Bernard announced the important discovery of a material formed by the liver, closely resembling starch, or, rather dextrine of vegetable origin, and like it readily changed into sugar in the presence of ferments. The discovery of this amyloid substance did not alter his views concerning the formation of sugar in the liver, but rather served to place his so-called 'glycogenic theory' on a more secure basis than before. Nevertheless, the researches of Dr. Pavy,[a] to say the least, cast great doubt on the correctness of this supposition, while the beautiful observations of Charles Rouget,[b] and of Bernard[c] himself, on the fœtal tissues, tend to show that the amyloid substance

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"[a] Philosophical Transactions, 1860, p. 595.

"[b] Journal de la Physiologie de l'Homme et des Animaux, tom. 2, pp. 83 and 308.

"[c] Ibid., tom. 2, p. 326.

(under certain circumstances) serves a very different end from that of being thus transformed into sugar.

"Some years ago, after a careful repetition of the experiments of Dr. Pavy, I was led to agree[a] with the conclusion arrived at by him, that the liver is not endowed with the power of converting its amyloid substance into sugar during life and health. If, therefore, not transformed into sugar, the question naturally arises, What becomes of it? What is its ultimate destination in the animal economy? It is my chief object in the following memoir to attempt to answer this question.

"I have elsewhere[b] stated, that although the question must be admitted to be one of the greatest delicacy, yet that it appears to me, on the whole, there is evidence that the amyloid substance met with in the liver is, as it were, on its way upwards towards the more exalted or complex immediate animal principles, and that its conversion into sugar is not its normal destination; that the process of healthy assimilation tends, if the expression may be used, to promote it from the rank of ternary (hydrocarbonous) to that of quaternary (azotised) compounds, and that its conversion into sugar is, therefore, a deviation from this progressive course—a *dissimilative* instead of an assimilative process. In order to establish this view it became necessary—

"First.—To re-examine, with precision, the facts which have induced Pavy to conclude that the amyloid substance of the liver is not transformed into sugar during life.

"Secondly.—To investigate the chemical and physiological relations of the amyloid substance, not only of the liver but of other organs and tissues, and test the very interesting results which are for the most part due to M. Charles Rouget.

"Thirdly.—To compare the portal and hepatic blood with each other, and with arterial and venous blood derived from other sources, and consider the relations to each other of the different functions performed by the liver. For if it be true, as Lehmann, Brown-Séquard, and others have asserted, that the fibrine and much of the albumen of the portal blood vanish in the liver, and that, at the same time that it destroys these azotised compounds, it forms its non-azotised amyloid substance and excretes bile, containing so little nitrogen that it need hardly be taken into account; are we not, from the consideration of these functions, led to infer that the nitrogen, which leaves the liver by no other outlet, may go forth in the hepatic blood, in union with the amyloid substance thus changed into a new azotised principle? That thus the liver is a

"[a] On the Physiology of Diabetic Sugar in the Animal Economy, 'Dublin Quarterly Journal of Medical Science,' August, 1859.

"[b] On the Formation of Sugar and Amyloid Substance in the Animal Economy. Proceedings of Royal Irish Academy, February, 1860.

> great blood-making organ, in which there is constantly going on a reconstruction of certain ingredients of the blood; that in it the fibrine, &c., which has done its work, is disintegrated, the hydrocarbons of the bile abstracted, and the nitrogen combined with the amyloid substance, which, instead of being normally changed into sugar, emerges from the liver as a constituent principle of the protoplasma, from the bosom of which (to use the words of Bernard with reference to the fetal tissues) organic evolution is to be accomplished."

The tendency of Dr. M'Donnell's views will readily be gleaned from the foregoing extracts. In a word his theory amounts simply to this, that the dextrine found to exist in the animal organism is *not* changed into sugar destined for the maintenance of animal heat, and consumed in the respiratory process; but that it becomes ultimately united with nitrogen, and so gives origin to nitrogenous compounds.

Dr. M'Donnell's arguments rest principally upon two fundamental points, namely, that, in the first place, as demonstrated by Dr. Pavy's and his own experiments, the conversion of the amyloid substance of the liver into glucose is not its normal destination under circumstances of perfect health; and secondly, that the proven ultimate use of this substance in the fetal tissues is not connected with the respiratory process. Dr. M'Donnell has elaborately worked out the latter problem, following up the researches of M. Charles Rouget and Professor Claude Bernard, adding to the microscopical observations of these physiologists his own original and exhaustive chemical investigations of this substance in the fetal tissues—investigations which, we think, amply justify the anticipations he thus expresses:—

> "I hope to be able to show, however, that the establishment of respiration has little to say to the disappearance of the amyloid substance from the tissues of the fœtus, and to prove that, in truth, certain azotised tissues are evolved from a nidus of amylaceous protoplasm, which, after a particular stage of growth, becomes less and less as each of these tissues approaches maturity, and that, when maturity is attained, the amyloid substance, which once formed so large an ingredient of the growing tissue, has gradually become changed, so as to be no longer discernible even before respiration has commenced."

In the latter pages of his memoir, Dr. M'Donnell enters upon the investigation of the differences in the blood which enters, and that which emerges from the liver, as well as upon the consideration of the functions of that viscus.

This portion of the essay—perhaps the most important—discloses our author's ingenious and most rational speculations upon the true destiny of the amyloid substance, and is, in fact, *the application*, so to speak, of the preceding chapters. Dr. M'Donnell very clearly conveys his impressions upon this point in the following sentence:—

> "It is true that there is nothing novel in the view that the liver is a great blood-forming organ, or rather that it is an organ in which certain components of the blood are disintegrated, while from some of the matter so disintegrated a constant reconstruction of the blood is going forward; yet it is certain that, not long since, physiologists would have been unwilling to admit that materials constituted as the colourless blood-cells or caseine, could be formed within the liver from a substance resembling starch taking to itself nitrogen, derived, as one may say, from the retrogressive metamorphosis of tissue. It is very improbable that, looking to the liver alone, such a conclusion would have been arrived at. The consideration, however, of the physiological relations of the amyloid substance (of Bernard), as regards the development of the azotised tissues of the fœtus—the fact that it is, so far as they are concerned, a protoplasma, which, by taking to itself nitrogen, terminates in the evolution of fully-formed nitrogenous tissue—prepares one to consider the idea that the liver evolves its proteic compounds during adult life by a somewhat similar process. To M. Charles Rouget we unquestionably owe the observation of the fundamental facts which lead to the foregoing conclusions; yet the author hopes that the recapitulation of facts in this memoir, will be found worthy of the consideration of physiologists; for he conceives that, not only is the view of the subject which he has ventured to adopt in harmony with a great number of hitherto unexplained circumstances, but that it gives a solution more satisfactory than any yet given of a number of pathological phenomena."

We regret that want of space forbids our following up, at greater length, our author's excellent observations, or reproducing the description of the ingenious device by which he has succeeded in abstracting blood from the right heart and ascending cava in the living animal. We must refer those interested in the subject to the memoir itself, which we can guarantee will amply repay their study.

The subject is one of great importance, both physiological and practical, bearing as it does upon the relation of the liver to the blood and tissues; on the influence of diet upon the organ itself, and offering a clue to explain many hitherto unintelligible pathological phenomena.

Notwithstanding the difficulty of the subject, which includes a series of problems among the most complex and abstruse met with in the whole range of animal chemistry, it has been handled by our author with an amount of skill worthy of his reputation as a learned and accomplished physiologist. The essay, though short, is a model of its kind, full of patient, thoughtful, critical research, cautious generalization, logical precision, and unselfish candour.

Atlas of Surgical and Topographical Anatomy. By B. J. BÉRAUD. Illustrated by 100 Plates, drawn from nature, by M. BION. Translated by R. T. HULME, M.R.C.S., Eng. London: Baillière. 1866.

WE have received the first and second numbers of this work, which it is proposed to complete in ten monthly parts, each to contain ten plates, with descriptive text. Certainly if completed in the style of the parts before us it will be one of the most valuable and at the the same time cheapest set of anatomical plates yet published. The plates in the numbers we have received show the regional anatomy of the head and face. They are most carefully and correctly drawn, and beautifully coloured and finished. The names of the several parts exhibited are indicated by references, and the dissections have been so made that the relative position of each part is seen at a glance. The chief points of pathological or surgical interest, in reference to the several regions, are also briefly enumerated. We believe there is no one practising either medicine or surgery, no matter how complete his knowledge of anatomy may be, who would not find this a most useful and satisfactory book of reference.

PART III.

MEDICAL MISCELLANY.

Reports, Retrospects, and Scientific Intelligence.

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF DUBLIN.[a]

Dr. M'Dowel, President.

Visceral Cancer.—Dr. Hayden exhibited a specimen of carcinoma of the thoracic and abdominal viscera. The patient was a man twenty-two years of age, of temperate habits, the son of a farmer in the King's County, who had enjoyed uninterrupted good health, never having had syphilis, rheumatism, or any other serious disease until July last. In the early part of that month he was employed cutting turf in a neighbouring bog, and while so employed had occasion to displace a large clamp of turf, and in the endeavour to do this, pushing it forward, he felt something give way in the region of the heart. This was followed by a sensation of scalding and of sinking, great difficulty of breathing, and vertigo. From this state he recovered in a few hours sufficiently to be able to return to his home; and at the end of three or four days he was so much restored to health that he was able to resume his work, but still was not quite well. Three months subsequent he complained, for the first time, of difficulty of swallowing. He experienced a stoppage in the lower part of the chest, below the ensiform cartilage, which applied only to solids, fluids passing without obstruction, but any solid food was stopped; it returned some distance; but on taking a sup of fluid, and making an effort, he was able to force it on. His mother became seriously ill, and in attending her he caught cold; had cough and expectoration, and now for the first time he had a sharp pain in the left side of the chest. He was sent to Phillipstown Hospital, where he was for some time, and was sent to Dublin on the 2nd of January. While in the train coming up he became suddenly jaundiced. On the third of January when he, Dr. Hayden, saw him for the first time, the entire cutaneous surface, was of a light lemon colour. The liver projected two or three inches below the costal cartilages, and was tender on pressure. The tongue was coated; the bowels constipated. The pulse was rapid (180 in the minute), but regular and equal on both sides. Respirations 36. The man was unable to lie down; he could only rest by leaning on a pillow placed on a table at the left hand side of his bed. There was difficulty in swallowing, as above described. The urine was loaded with bile. The left side of the chest was universally and absolutely dull, with a total absence of respiratory sound both before and behind, with the single exception that, near the angle of the scapula respiration was heard, of a tubular character, and here the voice was somewhat ægophonic. Vocal vibration was absent over the entire of left side, which, in girth, was half an inch in excess of the right side; the intercostal spaces on the left side were obliterated, but not protruded. On the right side percussion-resonance was normal, and respiration puerile. The heart pulsated with moderate force behind the right margin of the sternum, inferiorly. Its sounds were clear and unattended with murmur, but immediately before the first sound there was heard a remarkably grating noise, which, after careful and repeated examinations, he declared to be due to pericarditis. The heart's sounds were distinctly audible over the entire of the left side. There was no cough; no expectoration, and no enlargement of the special veins of the chest or neck, except two in the left axilla, which were distended, but not tortuous. There was no enlargement of the superficial lymphatic glands, or external tumour of any kind. The diagnosis was one of difficulty in some particulars. It was quite clear that there was effusion into the left pleural cavity, and that there was pericarditis. As regarded the liver he was somewhat puzzled, but after repeated examinations he came to the conclusion that there was acute hepatitis, and that in this way the extreme tenderness on pressure in the epigastrium, and the jaundice were to be explained. The man's condition remained scarcely altered until the 7th of January, that is five days after the day of his admission, when his pulse began to intermit, and he became exceedingly weak, partly from loss of sleep, and partly from inability to swallow nourishment. Leeches were applied over the epigastrum with some relief to the patient; repeated enemas were given, and opiates administered to procure sleep, and as nourishment, he got brandy and beef-tea with some bread crumb soaked in it; but on the 8th of January the pulse had descended to 150, while the respiration increased to 42, having previously been 36. From the 8th to the 14th his condition underwent a slight improvement; but on the 14th it was manifest the man was sinking, and now it was observed that the mouth was covered with aphthous ulcers. The breath was cold, the pulse flickering, and on the evening of that day he died.

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[a] These reports are furnished by Dr. R. W. Smith, Secretary to the Society.

On examining the body he found universal cancerous disease of the lungs, of the liver, pancreas, and mesentery. From the history of the case, from the mode of commencement of the man's illness, and from the symptoms that followed, he had an idea that it was some form of lesion of the great vessels at the base of the heart, although there were no physical signs to bear out such a supposition; but of the absence of such, an explanation, as it seemed to him, might be found in the copious effusion into the left pleura. The peritoneum was thickened, but not otherwise altered. The liver was remarkably large, and on its surface were several cancerous nodules of considerable size. On making a section of the liver it will be seen that the interior of the organ was pervaded with similar masses. The gall bladder was enormously distended with dark green bile. The pancreas was converted into a mass of medullary cancer, remarkably firm, and nodulated. The diseased head of the pancreas was found to have implicated the common biliary duct, and so compressed it as to have caused a retention of bile, and hence the jaundice. From the suddenness of the occurrence of jaundice he thought he should look for a more direct obstruction of the biliary duct, and accordingly he tried to find a calculus which however, did not exist. The mesenteric glands were likewise diseased, and the glands in both the greater and lesser omentum were similarly affected. The stomach, the spleen, and the left kidney were unaffected, but the right supra-renal capsule was greatly enlarged, and converted into a hard carcinomatous mass; it was adherent to the inferior lobe of the liver, and he had no doubt was infected from that organ by contiguity. The kidney itself was perfectly healthy. On opening the chest he found both pleural cavities full of fluid. He should have remarked that on the 7th of January he detected crepitis in the neighbourhood of the right nipple. This was succeeded or replaced by friction, and at the same time dulness on percussion posteriorly on the right side. That was the only evidence that existed of effusion. Both pleural cavities were found filled with a green serum. The left pleura was enormously thickened; it was covered all over with a layer of false membrane, $\frac{1}{16}$th of an inch in thickness, which might be peeled off with great difficulty from the surface of the lung, leaving the pleura unaltered beneath. The lung was remarkably heavy, perfectly solid, and of the volume of a partially inflated lung. On making a section he found the greater part of the organ converted into a scirrhus mass. Most of the blood-vessels, as likewise the bronchial tubes, were obliterated. Thickened bands of fibrous tissue, manifestly the hypertrophied interlobular tissue of the lung, were seen to pass from all points of the surface into the interior of the organ, branching and uniting so as to give the surface of section the appearance of being composed of a great number of distinct areolæ. Within these the pulmonary substance had become solidified. The walls of the bronchial tubes were likewise much thickened, whilst their cavities were nearly obliterated. The posterior margin of the lung was found thickened, and firmly connected with the mediastinum. The right lung was in a much less advanced stage of scirrhous transformation. The arrangement of the bronchial tubes and the areolæ between them, were similar to those on the left side, but the vesicular structure had not been solidified. The base of this lung only was engaged, the superior lobe being crepitant and quite healthy. The pericardium contained a large quantity of fluid; it was thickened. The surface of the heart was rough and covered with lymph, the result of pericarditis. The heart was flabby, but otherwise unaltered, the valves unaffected. The aorta and the great vessels connected with the base of the heart were perfectly healthy.

This was a case of considerable interest, at least negatively. They had got here the most formidable disease of the lung, of the pericardium, of the liver, of the pancreas, mesentery, and of the omenta; and yet there was no direct evidence by which one could have arrived at a diagnosis of this state of things. The man was only twenty-two years of age. His illness commenced with a violent muscular effort, followed by a sensation of injury in the region of the heart, and prolonged syncope, and then pain in the left side. At no time while under his (Dr. Hayden's) observation was there cough or expectoration of any kind. There was no hemoptysis, and no enlargement of the superficial veins, except what he had mentioned, and no external tumour. The dulness on the left side was explained by the effusion, and the heart symptoms and signs by the pericarditis. The only thing which should have awakened his suspicions was the suddenness of the accession of jaundice. The tenderness of the liver was so great as to effectually prevent a careful examination of that organ; and the enlargement of the liver, and its extension downward, prevented an examination of the more deeply seated organs of the abdomen. Whether reference be had, then, to the man's previous good health, the commencement of his illness with a sensation of injury within the chest, resulting from a severe muscular effort, the short duration of his illness, or the absence of evidence of disease of the lungs, and of *all* the symptoms and signs of carcinoma, with the single exception of acute jaundice, the error of omission in the diagnosis will probably be deemed excusable.—*January 20th*, 1866.

Chronic Laryngitis.—Dr. M'Donnell said the history of the case which he had to bring under the notice of the society was briefly this. The patient, from whom he obtained the little body which he had in a test tube, was a man about fifty years of age, who had been under his care for two or three years, suffering from senile phthisis. About this time last year he lost his voice, and presented symptoms of laryngeal disease. He came often to his (Dr. M'Donnell's) house, and having examined him, he saw ulcerations at the back of the vocal cords. From the frequent examinations to which he was subjected, he became by degrees very tolerant of examination with the laryngoscope. On the 17th of March, 1865, he came into his study, suffering from extreme difficulty of breathing; this was so great that if he had dropped down dead before he crossed the room he should not have been surprised. On examining him with the laryngoscope he found in the orifice of the rima-glottidis, a little body moving up and down. The patient said, that during the night he felt something in his throat, and that he thought it was a loose tooth that had dropped out; whenever he took a drink he felt something pricking him. Dr. M‘Donnell succeeded, with a curved laryngeal forceps, in catching the little body and bringing it out at the first attempt. At first he did not know what it was, for it was apparently like hardened mucus. He put it into a tumbler of water, and after washing it and picking at it, he got out the little body which he now exhibited, and which he perceived was the arytenoid cartilage. They could see the articulating process; and the body, being partially ossified, retained its shape so completely as to leave not the slightest doubt of what it was. It was apparently held by one of the little ligaments at the base, and was in fact dangling loose in the rima-glottidis. He was not aware that there was any other recorded case in which this cartilage had been removed in this way. In laryngeal phthsis it was not uncommon for the cartilage to become affected and subject to a process of exfoliation. Professor Smith informed him that there was in the museum of the Richmond Hospital a preparation in which the cartilage was to be seen dangling loose. The patient was instantly relieved by the removal of this body, and he subsequently died, on the 29th July last, of the senile phthsis which had been going on for some time. Dr. M‘Donnell, had frequent opportunities after the removal of the cartilage of examining the patient, and he saw the puckered and contracted place from which it had been removed. The loss of voice was very great; and although the patient could speak so as to be quite distinctly audible and readily understood, the power of modulating the voice was gone.—*January* 27*th*, 1866.

Necrosis of the Lower Jaw.—Mr. Croly said the specimen which he laid before the society was one that he removed that morning from a patient in the City of Dublin Hospital. He was a man about twenty-nine years of age, and had syphilis five years ago, for which he was treated with mercury (the special preparation being bichloride). He became profusely salivated; he had nodes on the tibia, and suffered from pains in the head. He returned home from America in March last, and when shaving one morning he found that his chin had a numb feeling—it felt as if it had been frostbitten. An abscess formed at the left side of lower jaw, between the angle and the symphysis; and being opened he got relief. An abscess then formed at the right side, and subsequently another formed under the chin. The disease went on, and it was evident that necrosis had attacked the lower jaw. The man applied at the dispensary of the hospital, and requested that something should be done. He (Mr. Croly) found, on passing a probe through the sinuses, that it touched dead bone in three places, and on grasping the teeth the bone moved. The patient had lost two incisor teeth and one molar. That morning, by a free incision internally (detaching the lip from the lower jaw) he succeeded in exposing the diseased bone, which he removed with the "lion forceps."—*January* 27, 1866.

Fracture of the Skull.—Dr. M'Donnell exhibited the skull of an individual, sixty years of age, who died in Mountjoy Prison last December twelve months. The man had been under his observation on several occasions. He noticed that he had a scar on the side of the head, and having asked him about it, the account he gave was, that about ten years previously he had been with a number of persons making up hay, and fell down from the top of the hay rick, thereby sustaining the injury in question. Of the actual details he could not get a good account. The man was stunned by the fall, and was carried home. He was seen by a surgeon, but nothing appeared to have been done for him, and he was left pretty much to himself. How long he laboured under the injury he (Dr. M'Donnell) could not ascertain, nor whether there were any symptoms of compression. He only knew that when the man came under his notice he had got this scar remaining, and that he was a man of considerable intelligence and acuteness. On the 22nd of December, 1864, he died of apoplexy.

When the scalp was removed, the depression in the cranium, which they observed in the specimen before the society, was seen; and when the calvarium was taken off, it was found that there had been a depressed fracture, which had gone through, and the edges of which were still very sharp. There was no evidence of there having been any inflammation of the dura mater at this point—it was not thickened or adherent. There was an indentation corresponding to the depressed fracture in the brain-substance, so deep and so marked that he regretted not having been able to take a cast of it at the time.

Dr. M'Donnell observed that in this case there had been a wound of the scalp and a depressed fracture of the cranium; there was no evidence as to whether symptoms of compression existed or not; even assuming that no such symptoms had existed, yet many practical surgeons held that in cases of depressed fracture of the cranium, accompanied with a wound of the scalp, it was sound and good surgery to have recourse to the trephine. Such treatment is advocated on the grounds that it is the best mode of preventing the occurrence of inflammation of the brain or its membranes, and it is recommended as being, on the whole, the surest mode of avoiding the dangers of inflammatory irritation.

It is, however, a very nice question to determine whether this is indeed the best method of avoiding the dangers in question. The application of the trephine, and the removal of a portion of bone from the dura mater is, under the most favourable circumstances, full of risk, as an exciting cause of inflammation. The case now brought forward very well illustrated the advantages of non-interference as a preventive measure.—*January* 27, 1866.

Cardiac Disease—Patent Foramen Ovale.—Dr. Bennett reported the following case of cardiac disease, consequent on patent foramen ovale.

The history of the case extended over five years from the first appearance of symptoms of cardiac disease.

The subject of the case was an officer of the Royal Navy, and it is to be presumed that at the time of his entering the navy he was free from any signs of organic disease. In the year 1860, while on board ship, he suffered from a severe attack of measles, and during the attack was much exposed in being transferred to a shore hospital during bad weather; he rejoined his vessel in a month's time, and shortly after, on going aloft, he suffered from a violent attack of palpitation. From this time he suffered constantly from palpitations up to the time of his death, in the Summer of 1865. He was invalided by a medical board in July, 1860, the opinion of the board being that he was suffering from incurable heart disease. In August, 1860, he consulted Sir Dominic Corrigan, and was treated by him for cardiac inflammation. After having been a short time under Sir Dominic Corrigan's care he went to the country, and improved much in health, although the palpitations continued; at this time they were less frequent than at any other, being absent for nearly a fortnight, while he was out much in the open air during the day.

In May, 1861, he consulted Dr. Stokes, but there is no note of Dr. Stokes' diagnosis at that time; the treatment which he prescribed was a combination of sedative and tonic remedies, amongst others the use of the shower bath. Dr. Stokes' treatment was, after a time, followed by marked improvement. In the end of the year 1862 he was so far recovered as to be able to go to sea again, and passed as a lieutenant, after the usual practice of gunnery, &c. He was not, however, free from palpitations during this time. In 1862 he was transferred to the Pacific station, and in crossing the tropics his health gave way, but was again somewhat restored by rest at Vancouver's Island; at this time the palpitations were followed frequently by great gastric disturbance and vomiting. He came home invalided a second time, in 1864, and was again under Dr. Stokes' treatment, and improved. He again went to look for an appointment to a vessel, but while in London he had to give up his intention in consequence of his illness returning. While in London he consulted Dr. Watson, but there does not seem to have been any accurate diagnosis made by him. He returned to Dublin, and was under Dr. Croker's care until his death. The only positive diagnosis which was made even at this time was that of hypertrophy of the heart; the left side of the chest contained a considerable amount of fluid, and he suffered much from hepatic enlargement. At no time during the course of the disease was there any cardiac murmur, though there was evidence of organic disease in the enlargement and palpitation. For some time before his death the treatment had been directed principally to relieve the distress caused by the enlargement of the liver and to quiet the heart's action. Some of the characters of the attacks of palpitation were peculiar, especially when taken into consideration with the facts revealed by *post mortem* examination. It was found that the palpitation was much relieved when he was laid down quite flat; he stated that they never came on while he was in bed, and he was often able to go through considerable exertion during an attack; he had bathed, rowed, and been on horseback while suffering from an attack. He had not been at any period observed to be cyanosed either during an attack of palpitation or at any other time; in fact, he usually became pallid during the paroxyms.

During an attack of palpitation on July 3rd, 1865, the patient, then aged twenty-four years, died suddenly; on the following day the *post mortem* examination was made by Dr. Bennett, in the presence of Dr. Croker and Mr. O'Connor. The chest being opened, the left side was found to be occupied by clear serum as high up as the second rib in front; the lung was adherent over the highest point which the fluid reached by bands of lymph of very old standing; these connexions fixed the border of the base to the second rib in front and to the angle of the fifth rib behind; the lung was fixed to a line connecting these points carried round the pleural cavity; the left lung, compressed into the upper part of the chest, was solid below, but the apex contained air; the right lung and pleural cavity were free from any disease. The pericardium was universally adherent to the heart by connexions which could only be separated by dissection. In no part of the chest was there any sign of recent inflammation. The heart was of great size, and was distended with fluid blood on the right side; on being removed and freed of blood it weighed, with a small part of the pericardium and the arch of the aorta attached to it, twenty-four and a half ounces; its circumference, following the margins of the ventricles, measured nineteen and a half inches; at right angles to the axis twelve and a half inches. On opening the right auricle the cavity was seen to be greatly enlarged, and the septum of the auricles perforated in the position of the foramen ovale, by an opening six and a quarter inches in circumference; the right auriculo-ventricular opening was over eight and a half inches in circumference. The right ventricle was greatly enlarged also, and its walls were thickened; the valves of both openings were free from disease, but evidently insufficient to close the openings, in consequence of their great increase in size: the septum of the ventricles was perfect, and the ductus arteriosus was completely closed. The left auricle was much smaller than the right, being not much more capacious than natural; its walls were somewhat thickened; the mitral orifice was of normal size, and its valves healthy and quite competent to close the opening completely; the cavity of the left ventricle was not enlarged, nor were its walls much, if at all, thicker than usual. The aorta was healthy, closed by perfectly healthy valves, but its size was much below that of an adult's aorta; it admitted the index finger with difficulty. The vessels springing from the arch had a calibre proportionate to the diminished size of the aorta. The liver was much above the normal size, its capsule slightly opaque, and it was congested to such a degree that blood flowed freely from the slightest scratch made with the knife; the intestines were distended with gas and congested, but there was no sign of any active disease of them.

It is probable that as there were no signs of cardiac disease in this case previous to the attack of measles in the year 1860, the following was the mode of occurrence of the pathological changes:—An attack of pericarditis occurred during the measles, perhaps brought on by the exposure in removal to hospital. With this, pleuritis, with effusion on the left side; the combination of these two impediments to the heart's action brought into play a pre-existing patent foramen ovale; then followed enlargement of the right side of the heart and contraction of the aorta. It is evident that for a long time before the fatal termination of the case the stream of blood through the foramen ovale was directed from left to right, especially during the attacks of palpitation; the character of the palpitation—namely, its being relieved by the horizontal position and its never commencing while the patient was in bed; and the pallor of the face observed during the palpitation, show that its principal cause was a want of blood in the vessels of the brain. This want of blood was caused by the deficient supply to the left ventricle, and the contraction of the aorta is the direct result of the deficient supply to the ventricle. An examination of the borders of the foramen ovale shows that the immense size of the opening was the result of the dilatation of the auricle and not from any congenital absence of the valve of the foramen. When the lower border of the opening was held up between the eye and the window muscular fibres were seen passing in curves from either side around the lower segment of the opening, and crossing each other midway between the sides; these fibres were arranged exactly as the fibres of the valve in a normal heart at birth are. The existence of these muscles in the border of the opening, while it proves that the opening was formed by dilatation of the margins and valve, explain, perhaps, to some extent the intermittent character of the symptoms during life: it is possible that although after death the opening was of so great size as to admit four fingers, it may have been much diminished by the contraction of the fibres bounding its lower half, and have been reduced somewhat to the form of the oblique passage which is so very often seen in this place in perfectly healthy hearts. There exists in the museum of Trinity College a specimen of this kind through which a finger can be passed, but the form of the heart is perfectly natural, free from any disease, and the individual from whom it was taken died at an advanced age of a disease unconnected with the congenital opening. The fact that the foramen ovale is frequently imperfectly closed is noticed by Morgagni, who gives a drawing of the condition commonly seen. The tissue of the heart shows, as might be expected in a case where it was so much enlarged, some amount of fatty degeneration. The case is one of great interest, as showing how imperfect are our powers of diagnosis of cardiac disease, and for the late period of life at which it is possible for congenital affections to give rise to fatal disease when brought into play by some accidental occurrence, such as the attack of measles in this case. When we consider that there was not in this case any symptom present which would indicate positively patent foramen ovale, and that the cardiac symptoms did not set in until so late a period of life, it is hardly to be wondered at that even the most eminent authorities failed to recognize the lesion. The character of the palpitations are worthy of notice, though somewhat similar occur in fatty disease; still it is not common to see the horizontal position prevent their occurrence, or relieve them in the more common disease of the valves of the heart.—*January* 27, 1866.

Cardiac Disease, Mitral Obstruction, Aortic Regurgitation.—DR. HAYDEN exhibited an example of disease of the heart, consisting of contraction of the mitral orifice, and regurgitation at the aortic orifice. The person, from whose body the morbid specimen was taken, was a woman, thirty-four years of age, a native of Liverpool. She stated, that up to the age of thirteen she had enjoyed the best of health. At that time she suffered from an attack of rheumatic fever, but from this attack she recovered without any permanent ill health. She suffered occasionally from hemorrhage from the bowels, which she attributed to hemorrhoids. Three years ago she received from her husband, whilst he was under the influence of drink, a blow with the clenched hand in the region of the liver. She was knocked down by this blow, and suffered considerable pain afterwards in the region of the abdomen; and shortly afterwards was attacked with anasarca and ascites. She was treated for this attack; her legs were punctured, and there was a considerable discharge of serum. She said, that she entirely recovered from this illness, with the single exception that her respiration remained embarrassed. While coming from Liverpool to Dublin, six weeks ago, she was greatly exposed to wet on the deck of the steamboat; and, on her arrival in Dublin, her breathing became embarrassed, and her legs swollen. She sought admission into the Mater Misericordia Hospital, on the 26th of January, and he saw her on that day. Her condition then was as follows:—Her face was quite livid, the lips in particular; the conjunctivæ were injected with purple blood; her finger ends were livid and cold, and she had lost the use of her lower extremities, which were cold, purple in colour, and enormously distended with serum, and in several parts of the surface of the legs minute openings had formed spontaneously, from which serum exuded. The pulse was rapid, exceedingly feeble, but quite regular; there was no visible pulsation of the arteries anywhere. She passed not more than three ounces of urine in the twenty-four hours, and this was loaded with bile. From the position in which the woman lay, and the danger of raising her into the sitting posture, owing to her extreme debility, it was impossible to examine the chest posteriorly, but it was examined in front, and up to the level of the nipple on both sides dulness was complete. This was attributed to effusion into the pleural cavities.

The heart pulsated in the usual situation; its impulse was pretty strong, and attended with fremissement. The heart's action, in the situation of the apex, was attended with two murmurs. One was rough, loud, and entirely confined to the region of the apex. This murmur *preceded* the first sound of the heart by an appreciable interval, and was an excellent example of what had been termed, a presystolic murmur; it was succeeded by the first sound, which was clear and unattended with murmur.

Another murmur was heard in the same situation, but less distinctly. This murmur coincided with the second sound of the heart. Over the base of the heart a single murmur only was heard; this was diastolic, coinciding with, or rather superseding the second sound; it was loudest at the base, but traceable in the course of the aorta for a distance of two inches. The liver projected considerably below the costal cartilages. It was firm on pressure, but smooth on the surface; and there was considerable effusion of serum into the peritoneum; the patient's fingers were distorted and disfigured, apparently by chronic gout. Such were the conditions on which a diagnosis of contraction of the mitral orifice was made, of regurgitation at the aortic orifice, of disease of the liver, not simply enlargement, but something more; and judging from the habits of the patient, which were intemperate, the diagnosis was made of cirrhosis. The condition of the patient admitted of no hope; all that could be done was to alleviate her sufferings while she lived. On the following day it was found that the patient had passed a restless night, having had no sleep whatever; she had now become pulseless. The punctures, which had been made on the previous day, in the legs, had yielded very little serum, and now it was observed that there appeared on the dorsum of each foot a large patch of incipient gangrene. On the following morning, at half past one o'clock, the patient died, having for some hours before death coughed up large quantities of dark blood; and the *post mortem* examination, made thirteen hours after death, revealed the following conditions:—

In the abdomen was found a considerable effusion of serum, but no evidence of peritonitis. The liver was contracted in its vertical dimension, that is between the thin and thick margins. It was not contracted transversely, but very much thickened. Upon the upper surface of the liver the capsules, both serous and fibrous, had become thickened and opaque. On section, the liver presented what he thought might be regarded as a good example of a nutmeg liver. The organ was otherwise not much altered; the spleen was found in a remarkable condition—not altered in size—but the outer surface of its capsule had become thick and opaque in colour. The examination of the thick part, under the microscope, showed it to be composed of fibroid structure, or elongated fibre-cells. In the substance of the spleen two large masses of a yellow mortar or putty-like substance were found. He had examined a portion of these under the microscope and found them to consist of fat, and probably of urate of soda. He was getting a chemical examination made, and would subsequently state the result. It would not be a little interesting if they found a deposit of lithate of soda, considering that the patient's joints were disfigured as if she had suffered from chronic gout. The kidneys were healthy, the cortex, perhaps, a little larger than usual. In the pleuræ he found a considerable effusion of serum. The lungs were evidently healthy in all parts save the bases; the bases of both lungs were opaque on the surface, and this opacity was manifestly due to thickening of the pleural and probably of the subserous fibrous investment of the lung. In this situation the lungs were dull, elsewhere resonant. This portion, on section, was semi-solid, yielding neither blood nor serous fluid. The condition of the bases of both lungs resembled that of the spleen and liver, and was due to the thickening, probably, of the fibrous investment and interlobular tissue. The pericardium contained a pint of straw coloured serum, and floating in it loosely was a flake of white membrane, attached neither to the surface of the pericardium nor to the heart. The heart looked as if daubed over with white paint; it was white and polished on the surface, and of average size.

In the right auricle was found a large thrombus, which extended to the auriculo-ventricular opening, through which it projected by a round bulbous extremity, but did not enter the right ventricle. The right ventricle was scarcely altered, but the auriculo-ventricular opening was closed by a bicuspid instead of a tricuspid valve. The left auricle was much thickened—in the sinus the wall was exactly a quarter of an inch thick. The auricle was likewise greatly enlarged. The left ventricle of the heart was rather contracted in size; its walls were slightly thicker; in the thicker portion they exceeded by a minute fraction half an inch. Left auriculo-ventricular opening greatly contracted, like a button-hole slit, and scarcely admitting the tip of the little finger; the mitral valve greatly thickened, rigid, and nearly calcified; the segments lay against one another, so that they must have opposed the entrance of blood from the auricle, without permitting regurgitation from the ventricle. The aortic valves were thick and rigid, and allowed the slow entrance of water into the ventricle, when poured into the aorta; the lining membrane of the ascending aorta was red, and dotted with yellow patches of atheroma in an early stage.

The only point of interest which the case possessed was that which had reference to the stethoscopic evidence on which the diagnosis of mitral contraction was made. This diagnosis was correctly made, and the evidence consisted in the existence of a murmur, audible over the apex of the heart, and confined thereto; this murmur preceding the first sound, which was clear and itself unattended with murmur. The differential diagnosis of mitral contraction was a matter of some practical importance, he need scarcely remind the society, because it was a much more formidable disease than mitral regurgitation. Thus, it was not unusually associated with gangrene of the feet, with hemoptysis and pulmonary apoplexy, and also with total failure of the pulse some hours, and even some days, before death. Some of the highest authorities in cardiac pathology have doubts as to the possibility of accurately diagnosing contraction of the mitral orifice from stethoscopic evidence. With great diffidence he ventured to differ with them in thinking it was possible to distinguish mitral contraction from mitral regurgitation by reference to the position in time of the mitral murmur with relation to the first sound. If the murmur *preceded* the first sound of the heart, being a mitral murmur, the disease was contraction, if it accompanied or immediately succeeded the first sound, it was regurgitation. Dr. Gull reported a case in a late number of the *Medical Times and Gazette*, and whilst admitting the failure of presystolic murmur, he said the absence of it did not prove that mitral contraction was not present. No doubt the presystolic murmur ceased to be audible some time before the patient's death, and therefore his statement was correct so far, nor was it difficult to understand why this should be. A valvular murmur required for its production two conditions—one, that there should be obstruction or inadequacy at the orifice itself; and secondly, that there should be a certain amount of propulsive force, determining the current of flux or of reflux. Some time before death the force of the heart's action became diminished, and thus the removal of one of the two conditions would involve, if necessary, a cessation of the murmur.

Measurements of heart.—Right auricle, normal; right ventricle, walls, $\frac{3}{16}$ of an inch thick at apex, $\frac{3}{8}$ of an inch thick at middle; left auricle, $2\frac{1}{4}$ inches from septum to outer wall, $2\frac{3}{4}$ inches from superior wall to mitral valve, 3 inches from anterior to posterior wall; left auricle, walls, $\frac{1}{4}$ inch thick in sinus; left ventricle, cavity, from mitral valve (root) to apex, $2\frac{1}{2}$ inches, from anterior to posterior wall, $1\frac{1}{4}$ inch; left ventricle, walls, $\frac{5}{16}$ inch thick at apex, $\frac{1}{2}$ inch in middle, $\frac{5}{8}$ inch at base; aorta (ascending), 1 inch in diameter.—*February* 3, 1866.

PROCEEDINGS OF THE DUBLIN OBSTETRICAL SOCIETY.[a]

TWENTY-EIGHTH ANNUAL SESSION.

Dr. M'Clintock, President.

Case of Inversion of Uterus after Delivery. By Dr. Denham.—Out of one hundred thousand deliveries that took place in the Dublin Lying in Hospital since its foundation, we have only a single instance of acute inversion of the uterus recorded. This solitary case occurred during the mastership of Dr. Shekleton, and is given in the valuable report of the hospital published by Drs. Johnston and Sinclair.

The subject was nineteen years of age, thin and delicate. She was delivered of her first child after an easy labour of six hours. Some slight pressure having been used by the attendant, the uterus was found suddenly to recede from the grasp, and was immediately expelled from the vagina an inverted mass, with the placenta still attached to it. The patient became pallid, almost pulseless, and exceedingly anxious; complained of considerable pain and a sense of sinking.

The placenta was easily separated without hemorrhage, and the uterus returned with but little difficulty in about seven minutes. No bad symptoms followed, and she was discharged in a short time, quite well.

There are cases on record where successful attempts have been made to reduce the inverted uterus after days, weeks, and years had elapsed.

Dr. Tyler Smith replaced a partially inverted uterus of nearly eleven years standing. He passed his hand, night and morning, into the vagina for several days, and endeavoured, by squeezing and moulding the uterus with the fingers, for about ten minutes at a time, to press the tumour upwards. After repeated trials he found the cervix uteri yield and the tumour could be sunk slightly in the os. On each occasion, after removing the hand, he passed one of M. Gariel's large air pessaries into the vagina, and inflated it to as great an extent as the patient could bear. The air pessary was worn day and night, with few exceptions. From the time it was first used the hemorrhage ceased entirely, and the tumour became somewhat less in size. After more than a week of these proceedings the patient felt a good deal of pain through the whole of one night, and in the morning, when the examination was made, it was discovered that complete reversion had taken place.

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[a] These Reports are supplied by Dr. Geo. H. Kidd, Secretary to the Society.

Mr. Teale has succeeded by similar means in a case of two-and-a-half years' standing. Dr. Marion Sims in his *Clinical Notes on Uterine Surgery*, relates two cases of chronic inversion—one of nine months' standing, in which he failed, after repeated attempts, to reduce the inversion, and was then obliged to remove the organ with the écraseur; and in the other, of twelve months' standing, he succeeded almost immediately by compression with the hand.

Without further preface I beg leave to bring the following case under the notice of the society:—Jane Savage, aged twenty-three, admitted into chronic ward 12th January, states that she was delivered of her first child five weeks before admission. The membranes ruptured, and the waters kept dribbling away for two days before labour set in; on the third day there was a red discharge, and labour pains came on that evening. She was weak and faint during the night, and was delivered at seven o'clock the following morning, with only three or four expulsive pains. The placenta was forcibly extracted by the midwife in about ten minutes after the birth of the child, both by traction on the cord and pressure on the fundus of the uterus. Some difficulty or delay seems to have heen experienced in its removal, for the patient described the nurse as having twisted something like a cord round the wrist of one of her hands, with which she made considerable traction, while at the same time she strongly pressed on the belly with the other. During this time she suffered a great deal of pain, but suddenly got relief by the expulsion of a large tumour from the passage, which led her to exclaim—"Oh, Mother of God! am I going to have another!" The placenta, which was partially detached, was now entirely separated, and the uterus thrust into the vagina. The poor patient remained weak and exhausted all the day, passing from one attack of syncope to another, until four o'clock, when she was seen by the dispensary doctor, who, unfortunately, only felt the pulse and looked at the patient, but made no examination. She remained in bed for eleven days, and then got up a little every day until her admission; the doctor saw her twice, but never made a vaginal examination; in fact, he never diagnosed the nature of the case. During all this time she had a continual shedding, especially at night.

She came into hospital in a most pitiable condition—pale, weak, and exhausted, from the combined loss of blood, appetite, and rest. In making an examination we thought we had simply to do with a case of polypus; but on passing the finger round the neck of the tumour we could not discover the os uteri, while at the same time the tumour wanted the smooth polished surface generally met with in such cases; we therefore came to the conclusion that it must be a case of recent inversion of the uterus. A generous diet, with a liberal supply of wine, was ordered. Citrate of iron and quinine, with an anodyne at bed-time was prescribed, with perfect rest in the horizontal position. The poor woman greatly improved under this treatment, so that we were able to attempt the reduction on the fourth day after her admission. Having been brought fully under the influence of chloroform, she was placed on her back, with the thighs flexed on the pelvis, and the legs on the thighs. The hand was then slowly introduced into the vagina, and the fundus and body of the inverted uterus firmly grasped with the fingers and thumb. Steady gentle pressure in this way was brought to bear on the entire tumour for several minutes before any attempt was made at reduction. The tumour gradually diminished, partly from the pressure and partly from the loss of blood, which was very considerable. Pressing steadily upwards, the uterus was now felt gradually to yield, and in a short time the fundus alone remained unreduced; no amount of force, however, compatible with the safety of the organ could enable us to complete the operation, and as the patient was faint from the loss of blood, we did not consider that we were justified in making any further attempt at reduction for the present. The vagina was now syringed out with cold water, the patient was replaced in bed, and a full anodyne administered. On the following day we found her with a rapid pulse and complaining of pain and tenderness over the uterus. Opium, with small doses of mercury, were freely administered, and linseed poultices were kept over the abdomen constantly.

The symptoms gradually subsided; and on making a vaginal examination on the third morning after the operation we were agreeably surprised to find that the fundus had spontaneously returned either by its own elasticity or the contraction of its muscular fibres. For many days we had a very profuse purulent discharge from the uterus, but the patient steadily improved in appearance and health, and was able to get up for a few hours every day at the end of a fortnight. On examining with the speculum about a week after the reduction we found the os uteri ragged and inflamed, but the sound passed up readily into the cavity of the uterus without causing much pain or uneasiness. She was discharged from hospital in perfect health, having menstruated regularly a few days before leaving. We have nothing further to add, only to express our regret that the accident was not discovered immediately on its occurrence. It is useless to speculate on the result had the fundus not gone up of its own accord after the first attempt at reduction; it is possible that a repetition of the former plan of treatment might have succeeded. The successful plan followed by Dr. Tyler Smyth, with M. Gariel's air pessary, might have again been tried, but I am free to confess that the careful daily manipulation of squeezing and moulding the displaced uterus had more to do in the reduction than the air pessary, as I can scarcely believe that it could be distended sufficiently to act on the constricted portion of the uterus, which, in my case, at least, appeared to be at the upper part of the unreduced organ rather than in the portion near the vagina; but this, of course, is mere matter of conjecture.—*10th March*, 1866.

Dr. Wilson read the following paper:—

Ophthalmia of New-born Children.—Purulent Ophthalmia of Infants; Ophthalmia Neonatorum; Purulent Eye of New-born Children (Ware, 1805). Blepharophthalmia Glandulosa Neonatorum (Benedict, Beer). Blepharitis Puriformis Neonatorum; Lippitudo Neonatorum; Blepharoblennorrhea Neonatorum; Blepharophthalmia Blennorrhoica Recens Natorum. Ophthalmoblenorrhea Infantum (Stellwag).

The earliest observation respecting this affection, with which I am acquainted, is that by John Peter Albrecht "De Lachrymis Lacteis Fluxuque Oculorum Chyloso in Infante Recens Nato," contained in the ninth volume of the *Miscellanea Curiosa*, published at Nüremburg, 1691.

In 1750 Samuel Theodore Quelmalz, also a German, published his *programma de cœcitate infantum, fluoris albi materni ejusque virulenti pedissequa.*

The first accurate account of the disease was written in 1780 by James Ware, an English surgeon of great merit.

Independent of Ware, and, as it would appear, totally unacquainted with his essay, William Dease, one of the most distinguished men of his day, and who by his teaching, and learned as well as practical writings, contributed in no small degree to the fame and celebrity of the Dublin School of Medicine, published, in 1783, in his *Observations in Midwifery*, a description of this malady.

In 1824 Isaac Ryall, "Surgeon Oculist to the National Infirmary for Curing Diseases of the Eye in Dublin," published a very good account of the disease in the fourth volume of the *Transactions of the Association of the Fellows and Licentiates of the College of Physicians.*

In 1835 Dr. Evory Kennedy read a valuable memoir before the British Association, then holding its meeting in Dublin.

In 1839 Hugh Carmichael wrote a long and faithful account of the disease in 15th vol. of the *Dublin Journal.* Many of those present may recollect how energetically he advocated the administration of grey powder.

Evanson and Maunsell mention it very briefly in their *Management of Diseases of Children*, 1838.

Drs. Johnston and Sinclair give a short chapter on the subject in their *Practical Midwifery.*

Sir Wm. Wilde alludes to it in his "Reports on the Progress of Ophthalmic Surgery," *Dublin Quarterly Journal*, 1847 and 1848.

Drs. M'Clintock and Hardy have written a very valuable and practical chapter on ophthalmia neonatorum in their *Observations on Midwifery*, 1848.

Purulent ophthalmia may occur at any age; it is frequently seen in early life, and but rarely in advanced age; it is sometimes exceedingly rapid in its course, and generally most destructive to the eye if neglected. No matter at what age it occurs, however, whether in the young or the old, the disease is in all respects alike; its symptoms, progress, and results will be almost the same. The remarks I am about to make will, therefore, be on the whole equally applicable to the affection in new-born children or in youths and in adults.

Ophthalmia neonatorum is an inflammation of the conjunctiva with mucous or purulent secretion, and manifests itself on an average on the third day—nearly invariably within a week after birth; it may occur a few hours after birth, or not appear for a fortnight subsequently; its severity would appear to be in proportion to its early occurrence. We rarely witness it in its earliest stage, owing to the ignorance or neglect of the mother or attendant. The lids, at the commencement of the disease, are somewhat red at their margins; the conjunctiva lining the lids slightly red and vascular; a small quantity of whitish mucus is usually found at the inner angle or lying in the fold between the globe and lower eyelid. There is slight intolerance of light, and the eyelids are kept closed, and after sleep, are found stuck together. The globe of the eye appears quite normal. Advice is very rarely sought for at this early period—the infant is incapable of expressing its particular sensations or sufferings; the redness, even if perceived by the mother or nurse, is attributed to a mere cold, and the eye is bathed in some warm fomentation, or mother's milk, &c.

After a couple of days the intolerance of light increases, the lids begin to swell, and a discharge occurs; the infant is irritable and fretful. If the disease progresses the lids become more and more swollen and red, especially the upper one, which not unfrequently overlaps the lower one; the eyelashes are matted together by the discharge, which becomes hardened and gums the eyelids together. On opening the eyelids, the discharge, which is generally of a pale yellow colour and rather thick consistence, flows out over the cheek. The conjunctiva of the lids and globe is intensely red and vascular, and generally protruding slightly beyond the level of the cornea.

Should the disease continue unchecked the eyelids become more and more swollen and prominent, partly from serous effusion into their texture, and partly from the accumulation of secretion between them and the globe; they are shining, extremely red or purple, with distended and engorged veins, and present a truly alarming and terrifying appearance. One or both of the lids may be found everted. The infant is suffering pain, as is evident as well from its irritable cry as from the wrinkling of its forehead and corrugation of its brows. In this state it is usually brought for advice and treatment. On opening the lids a gush of yellowish matter occurs, and the upper lid frequently turns inside out; bleeding also occurs frequently. The conjunctiva has been resembled to the injected fetal stomach: it bulges forwards and overlaps the cornea constituting what is termed chemosis. From the great swelling of the ocular and palpebral conjunctiva, and also owing to the facility with which the eyelids become everted, it is very difficult to get a view of the cornea. That membrane is at this stage of the disease generally greyish, either in its entire extent or at one or more spots: it has lost its polish, and the whole of its external epithelial layer may present a macerated appearnce; its laminæ may be infiltrated with pus, or it may present an ulcerated condition. This ulcer is, as a rule, circular and near the centre; it may, however, be at the periphery, and horse-shoe shaped, when it will be more dangerous to vision; the anterior chamber may also contain pus. This condition may exist for several days, the lids appearing almost on the point of bursting, and the discharge becoming more and more profuse, until finally the cornea gives way, and allows the escape of the aqueous humour. The tension of the globe being removed relief quickly ensues; the tumefaction and redness of the lids begin to subside, the swelling of the conjunctiva diminishes, and the discharge becomes thin and greenish; and when we obtain a view of the parts we find the cornea perforated and the iris protruding.

The character of the discharge varies: in some it is whitish and simply mucous; flakes or shreds of mucus are seen floating or lying in the abundant lachrymal secretion. In such cases the disease is, as a rule, mild, and partakes more of a catarrhal nature. In other instances the discharge is yellowish or greenish, and essentially purulent, always coexistent with a very high degree of inflammation, and great danger to the eye.

The disease commences frequently only in one eye, and subsequently attacks the second.

The duration of the disease is about three weeks; even in favourable cases it rarely terminates completely under a week. In mild forms the disease may continue for weeks, and finally terminate favourably. In very severe cases vision, or even the globe, may be destroyed in a very few days; in this, as well as other respects, the affection bears a very close resemblance to leucorrheal or gonorrheal ophthalmia in the adult;

it has indeed been denominated "ocular gonorrhea of the new-born" (Augentripper) by a German writer (Eisenmann).

It is nearly always a matter of difficulty to obtain a view of the cornea and iris. The lids are enormously swollen. On attempting to retract them from off the globe they very easily become everted, the conjunctiva is distended, and tumefied, the globe is rolled upwards, and all the parts covered with matter. All these circumstances, added to the infant's unsteadiness, render it difficult to get a good or continued view of the cornea. It may not be out of place, therefore, to offer a few remarks on the mode of examination. The nurse should be put sitting in a chair opposite a window, the infant placed on her lap also facing the light, with its head resting against the lower part of the nurse's chest, and its feet or clothes secured between her knees. The nurse's arms should be placed around the infant's body, securing its arms and hands. The examiner, standing or seated to the right of the nurse, then places the flat of his left hand on the top of the infant's head, spreading out the four fingers fan-shape, so as to embrace as much as possible of the head—bearing in mind that the anterior fontanelle is still open—and brings down the thumb of this hand over the forehead so as to elevate either the right or left upper lid, as may be desired. The right hand is then placed under the chin, or angle of jaw, with the fingers spread out, so as to embrace the lower jaw on each side, while the thumb is at liberty to draw down the lower lid; or this hand may be used to cleanse the eye. By this means the child's body and head are steadied and fixed; and even if the head does move the examiner's hands must participate in the movements, and his fingers cannot do any mischief to the eye. I would especially direct attention to the great danger incurred in separating the eyelids by means of the points of the two index fingers; in any sudden motions of the head forwards or latterly, the globe may be pushed against the fingers, and thus subjected to violent concussion. If the cornea be ulcerated or perforated, the most disastrous results may ensue. It has happened before now—not a little to the horror and consternation of all concerned—that the whole contents of the globe—aqueous humour, crsytalline lens, and vitreous humour have been shot out on the examiner's hand, or on the child's face. In order to avoid eversion we should, in raising the upper lid, seek to raise it bodily in a straight line towards the eyebrow, keeping it gently pressed against the globe. I am in the habit of placing the nail of my thumb or index finger under the free margin of the lid, and then steadily and slowly pushing or raising up the lid. This requires, however, some dexterity and practice, and is a manœuvre I could not recommend to those who are not very conversant with manipulations about the eye. We may occasionally get a glimpse of the cornea by seizing the eyelashes of the upper lid between finger and thumb, and drawing the lid away from the globe. Should these methods fail, and it be considered necessary to obtain a view of the parts, recourse must be had to elevators or retractors. I consider those of Desmarres—now before you—the best; one for the upper and one for the lower lid; they are smooth, polished, and curved, so as to be adapted to the inside of the lids. Care must be taken not to exert any pressure on the globe; and it will be necessary for an assistant to hold the head, or for the examiner to take the child's head between his knees. The lower lid is so easily managed I need not dwell on it. We should be always careful to replace an everted lid, or it may otherwise remain everted for some days, as the conjunctiva becomes swollen and enlarged when exposed. I have dwelt thus long and, perhaps, tediously on these matters; as I consider it of great importance to be able to examine an eye with safety to the organ and satisfaction to ourselves; moreover, we should never give an opinion as to the result without having first satisfied ourselves of the state of the cornea, iris, &c.

Various *causes* are assigned for this disease, such as heat, cold, draughts, sudden changes of temperature, bright light, irritating substances, such as soap, whiskey, gin; and, finally, vaginal discharges. I do not believe however, that either light or heat, such as the infant's eyes are exposed to, can produce an inflammatory condition of the conjunctiva. The infant's eye is, I think, comparatively insensitive to light. It has also been proved by experiment that heat affects the retina but very slightly. In the adult we daily witness affections of the nervous apparatus of the eye as well as of the nervous centres, and conjunctivitis is an exceptional complication. Exposure to cold draughts, sudden and marked changes of temperature, vitiated atmospheres, may and do, I believe, contribute largely to the production of this disease; but in such the affection, as a rule, manifests itself late, the symptoms are mild, the discharge mucous, and recovery generally takes place without any very bad results The cause which I regard as the most frequent, as well as the most dangerous, is the direct application to the infant's conjunctiva of either gonorrheal or leucorrheal matter, or of morbid secretion from the eyes of other individuals. The members of this society are well aware of the very great frequency of chronic vaginitis or leucorrhea in pregnant females. Now, it is readily conceivable how some of the vaginal discharge may gain access to the child's eye during birth, and set up an inflammation of a similar nature, unless speedily and effectually removed. It may be urged by some that the child's eyes are closed during birth, and otherwise protected; but the eyes are opened on the head emerging, and there is plenty of opportunity for their receiving the virus before the birth is completed, either directly or by means of the deliverer's hands. Another objection has been advanced, viz., that if the conjunctiva be inoculated, so ought also the mucous membrane of the genitals of the female; but it appears to me these parts are to a certain extent naturally protected from contact with the vaginal walls, and they are, moreover, I think, much more effectually cleansed by immersion in water after birth. The highly contagious nature of leucorrhea is admitted by all, and my only wonder is how so many infants of infected mothers escape. Of 328 women who were delivered in the Lying-in Hospital in Stockholm in 1832, 181 were free from vaginal discharge, and 137 affected therewith; 30 of the children had ophthalmia. Of these 20 belonged to infected mothers and 10 to non-infected. While these figures prove that the disease does not in all cases arise from this cause, they show that it does so in the majority of cases, the proportion having been 1 in 7 of affected mothers, and but 1 in 18 of non-infected mothers. These statistics agree with the opinion expressed by Drs. Hardy and M'Clintock, who state that while the disease "was not exclusively confined to the infants of women suffering under lucorrheal discharges or gonorrhea, although where such existed the child was more liable to the disease."

Opinions are still divided in this matter; my own experience is that in the great majority of instances the mother is the subject of vaginal discharge. Dr. Churchill, however, in his valuable work on *Diseases of Women*, states that he has never met with a case of purulent ophthalmia caused by the infant's eyes coming in contact with the leucorrheal discharge during the passage of the head through the vagina.

The disease is also occasionally communicated by means of sponges, towels, and other articles which have been in contact with morbid infectious secretion elsewhere.

It is occasionally epidemic; and in some places, such as foundling hospitals, workhouses, maternities, &c., endemic. It is highly contagious, for we sometimes see melancholy cases where the mother or attendant has been seized with the same disorder.

The mildness or severity of the attack will depend principally on the cause: it is most formidable when caused by gonorrhea or leucorrhea. The disease may terminate favourably, and leave no trace of it whatever; a very common result, however, is opacity of the cornea, which may occupy a greater or less extent, or involve all the layers, or be simply superficial. The iris may be adherent to the cornea, forming synechia anterior, which results from ulceration and perforation of the cornea, with prolapse of the iris, and in consequence thereof the pupil may be distorted in various directions, or be completely obliterated; or there may result a small white speck on the front of the capsule of the crystalline lens—denominated central cataract, and often, erroneously, congenital cataract. This arises when (the cornea being burst and the aqueous lost) the capsule comes in contact with the ulcer, and lymph adheres to it. The crystalline lens may also escape, and so also may the entire contents of the globe, and the eye collapse; or the globe may become staphylomatous and project between the lids, presenting a most unsightly object, as well as being a source of great danger to the other eye.

Terrible and alarming as the disease undoubtedly is, it is satisfactory to know that it is perfectly amenable to and controllable by treatment. The principal part of the treatment consists in constant and effectual cleansings and ablutions. For this purpose tow is preferable to sponges, as the latter are liable to be used for other purposes, or by other individuals, and so to propagate the disease; the tow should be always thrown away after use. The lids should be well fomented with warm water, so as to soften the discharge which has collected on and matted together the ciliæ. The lids are then to be drawn asunder, and the discharge *effectually* wiped away from off the conjunctiva. A stream of water pressed out of the tow may be allowed to fall from some little height into the palpebral aperture. The water for this purpose may be very nearly cold. This extemporized douche will in many cases be found most serviceable, not alone in the ophthalmia of infants but also in juveniles and adults. I have seen it carried out with beneficial effects in a large number of cases by my friend M. Chassagnac, of Paris. Sir Wm. Wilde, many years ago, had a special apparatus fixed up in St. Mark's Hospital for this purpose. I order the affected eye to be cleansed every hour, and generally apply a solution of nitrate of silver (2 grs. to the oz.) every morning or every second morning, and prescribe a lotion of some astringent substance to be kept constantly applied to the eye. I would prohibit altogether the use of acetate of lead, which was first recommended in these cases by Dease, for if there be any ulceration it is likely to leave a white deposit on the cornea. The lotion should be applied by means of a single fold of fine linen or lint, which should be constantly changed or remoistened in the lotion—the effect of several folds will be that of a steam-bath or poultice, and this I would avoid. The infant's health should, at the same time, be attended to; its bowels freed by castor oil, or grey powder, with aromatic powder, or grey powder and rhubarb, &c.; and all causes likely to keep up or aggravate this disease removed. Changing the infant to another apartment will sometimes be found most serviceable. In the milder forms of disease, or when it is seen early, this treatment will suffice; but the majority of cases are not brought to us until there is great chemosis and the cornea is threatened with destruction. Here I clip the chemosis with a curved scissors, and scarify the conjunctiva of lids by lightly running the convex edge of a small scalpel across it in different directions. By this means we not only deplete and relieve the great congestion, but we also remove the pressure from off the globe, and more particularly from around the cornea, by which its vitality is threatened. The bleeding may be encouraged by warm fomentations. My objection to leeching infants is the very troublesome and uncontrollable hemorrhage which sometimes ensues, as well as the unsightly marks which occasionally result. In severe and rapid cases the chemosis may be clipped a second or third time in the day. The affected eye should be washed at least once an hour. I apply a strong solution of nitrate of silver, 5 or 10 grains to the ounce, to the conjunctiva, after effectual removal of the secretion, and prescribe astringent lotions. I have in a very few cases employed the *lapis mitigatus*, but I prefer the solution of nitrate of silver. Lapis mitigatus consists of equal parts of nitrate of silver and nitrate of potash fused, and run into moulds.[a] After its application the residue should be washed off with solution of chloride of sodium. I always use in these cases a solution of sulphate of atropia. The atropine solution of the *British Pharmacopœia* is objectionable in ophthalmic practice from the large quantity of spirit contained therein, which is very painful and irritating. I now always employ the sulphate of atropia, which is readily soluble in distilled water. The object of this preparation is to keep the pupil dilated, whereby the iris is prevented to a certain extent from prolapsing through the cornea in case of a perforating ulcer, or even if recently protruded the atropia will retract the iris. I am inclined to think that dilatation of the pupil diminishes intraocular pressure and relieves vascularity, and therefore use it largely in all ocular inflammations.

The bowels are to be freed; and I prescribe tonics, frequently syrup of bark, to which may be added, if the infant is very restless and irritable, tincture of hyoscyamus. It may be necessary also to attend to the mother's or nurse's state of health, and occasionally a warm bath will be useful to the infant.

Should the disease be endemic, stringent measures must be adopted to eradicate it.

The mother or attendant is, in every case that comes before me, warned of the contagious and dangerous nature of the malady; and I am in the habit of advising the mothers to place themselves under special treatment in their next pregnancy, with a view to the cure of the vaginitis.

A consideration of the results of this disease and their treatment would be scarcely suitable to this society; it would, moreover, require one or more separate papers. I may mention, however, that the opacities of the cornea, if uncomplicated with adherent iris, disappear almost entirely. I have been astonished at the rapidity and completeness with which they sometimes disappear. Not long ago a medical friend placed under my care an infant with the disease in both eyes. The right cornea was completely opaque, and the iris protruding: the left cornea nearly entirely opaque. The case was so bad I gave an opinion that the child would have but limited vision, and that on the left side only. Notwithstanding, however, I kept atropia solution constantly employed, &c., and the child now, after four months, has almost perfect vision in both eyes, the prolapsed iris having returned to its normal position.—*April* 14, 1866.

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[a] This preparation may be had at Bewley and Hamilton's, Sackville-street.

A Case of Double Monstrosity. By Dr. M'Clintock.—The specimen now exhibited to the society, was sent to me by Surgeon Fitzpatrick, of Enniskillen, who has since presented it to the Museum of the Royal College of Surgeons. Dr. John Barker, Curator of the Museum, has favoured me with a brief anatomical description of the monster, so far as he has been able to dissect it, without injury to its shape and external configuration.

"The specimen," writes Dr. B., "may be said to consist of two female children, joined together by the anterior part of each thorax in a nearly symmetrical manner, from about one inch below the chin of each to the umbilicus, which is single. The shoulders, on one side, are about three and a half inches apart, and on the other side about two and a half inches. The limbs are perfect, and well formed, and there is only an arrest of development of one external ear. On removing the integuments, in the median line, between the two, from above downwards, the thymus gland of each side was distinct. Then, from above downwards, we see the large radiating fibres of the great pectoral muscle, larger, I think, than in the normal state; the left was larger than that on the right side. A little below the episternal notch, on the right side, a band of muscular fibres extended downwards, and outwards on the surface of the pectoral, and were lost on the rectus abdominalis. On cutting at each side of the common sternum, and through the clavicles, and throwing down this flap, the following parts were exposed: on the right, what appeared to be a pleural cavity; on the left the pericardium, which rested on the diaphragm below, as in the normal state; no lung was seen.

"On opening the pleural cavity the whole of the right side of the thorax was occupied by the liver, which extended downwards, and to the left side, joining that of the second fetus under the diaphragm, which was found to be deficient in the right side of the abdomen. Upon opening the pericardium we had the heart not much larger than natural. From its base three vessels appeared to arise, one for each fetus, and one or two in the median line. There were two sets of hypogastric arteries."

One of the fetuses, I may remark, is somewhat smaller than its fellow; and, judging from their bulk and general development, I should not suppose they were more than eight months children. From the gentleman who sent up this preparation, I have learned the following particulars of the labour. The mother was a healthy woman, aged twenty-six years, and this was her fourth confinement. When Mr. Fitzpatrick was brought to see her she had been suffering for some days with short, teazing, ineffectual pains. He was at once struck by the enormous size of the abdomen, and, concluding that the imperfect uterine action was due to over-distention of the uterus, he gave a dose of ergot; and, as soon as this had excited some pains, he ruptured the membranes, whereby about three gallons of liquor amnii were discharged. On now passing the hand over the uterus he distinctly felt two heads. As no presentation could be reached, he, with some difficulty, passed his hand into the uterine cavity, and brought down two feet. No pains coming on, he administered another dose of ergot, which acted well; nevertheless, his efforts at delivery were unavailing. To find out the cause of this difficulty he passed up his hand into the vagina, and, to his great surprise, found there the knee of another child. He tried to push it back, but could not, in consequence of a strong pain coming on. The four legs were now down, and, under the influence of powerful uterine contractions, he was able to withdraw the bodies and heads without much delay. The children were born alive, and lived for about twenty minutes. There was one large funis and a very large single placenta. The mother was quite well and up within a week afterwards.

Monsters of this kind are, happily, of extremely rare occurrence. I do not believe that the experience of the Lying-in Hospital supplies a single instance of such. Nevertheless, many are to be met with in the records of midwifery, and especially in the *Transactions of the London Obstetrical Society.* To us accoucheurs the point of greatest interest connected with these monsters is the manner of their delivery, and upon this point I wish to offer a very few observations.

Treatises upon midwifery give us very little information on this matter. Dr. Churchill (*Theory and Practice of Midwifery*, fifth edit., 491), is satisfied with quoting the observations of Dr. Burns, viz.:—" The general principle of conduct must be, that, when the impediment is very great, and does not yield to such force as can be safely excited by pulling that part which is protruded, a separation must be made, generally of that part which is protruded, and the child afterwards turned, if necessary. Unless the pelvis be greatly deformed it will be practicable to deliver, even a double child, by means of perforation of the cavities, or such separation as may be expedient, and the use of the hands, forceps, or crotchet, according to circumstances. A great degree of deformity may render the Cesarean operation necessary."

These directions, it must be confessed, embody no principle of treatment, and are altogether too general to afford us any guidance in particular cases.

Now, I believe, that in regard to delivery, the two fetuses should be treated as *a single one;* and, as in single births we always aim at delivery by the head or by the pelvic extremity, so, in the case under consideration, we should endeavour to bring the monster through the pelvis, by the two heads simultaneously, or by the two pelves (or pelvic extremities) simultaneously. Acting in accordance with this precept will entail less trouble, I think, than if we proceed by getting one of the fetuses disengaged from the pelvis, before the other. If the fetuses be small, as they generally are, their extraction together, will not be attended with any very extraordinary difficulty. If, on the other hand, they be full sized, or the pelvis be small, the difficulties to be overcome in their extraction, will not be so great, I conjecture, as if the other mode of delivery be followed. I am, of course, taking it for granted that the exact nature of the case is known to us. But this knowledge is seldom acquired till the delivery is too far advanced to admit of any material alteration in our plan of proceeding. The difficulty most likely to present itself is, to decide whether the second head, or second set of legs, following upon, or along with, the first presentation, belongs to a twin fetus, or appertains to a double monster; and, yet, upon this rests an essential difference in the treatment. For, in the case of twins, the intruding part of the second fetus should be pushed up, so as to let the other fairly engage in the pelvis; but with a double monster, the two heads, or two sets of pelvic extremities, should be encouraged to enter the pelvis together—at least if the principle I have laid down be the correct one. How, then, are we to distinguish a double monster from twins, under the above circumstances? Whilst admitting that this is a very pertinent question, I must, at the same time, confess it is one not easily answered. The presence of two fetal hearts, at some distance apart, or of two separate sets of fetal membranes, would prove the case to be twins; but in the absence of these signs, to establish the fact of a double monstrosity, at this period of the labour, can, perhaps, only be done by careful digital or manual exploration.

TRANSACTIONS OF THE COUNTY AND CITY OF CORK MEDICAL AND SURGICAL SOCIETY.[a]

SESSION 1864-65.

PRESIDENT in the Chair.

On Digitalis, and its Uses in Medical Practice. By H. MACNAUGHTON JONES, M.D., one of the Demonstrators of Anatomy, Queen's College, Cork.

A drug so often commented on, about which, from time to time, so many discussions have arisen; it may appear rather hackneyed to bring it forward for further comment; yet I think there are still some points of sufficient importance, interesting alike to seniors and juniors, that warrant a careful notice of its effects, as practice and theory have demonstrated, and experience proved.

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[a] These reports are supplied by Dr. Curtis, Secretary to the Society.

Digitalis purpurea, better known as foxglove, appears to have been first noticed particularly by Haller and others of his time, and strange to say, then as a remedy for scrofula, for which, of course lately, it has gone out of use; but Withering appears to have been the first who drew the particular attention of the profession to it as a remedy in dropsies, cardiac, and renal, as a sedative of the circulation, and as a diuretic.

Its well-known appearance often imparting, during the months of June and July, a brilliant look to our Irish ditch sides, with its beautifully tinted spike, covered with pendulous flowers, purple, or rarely white, contrasting well with its peculiar thick leaves, downy on their under-surface only, this latter characteristic distinguishing them from those of their adulterations, comfrey and verbascum thapsi, while their peculiar bitter taste also serves as an additional peculiarity.

In considering it:—

1st. I would first propose to glance at its properties dependent on its active principles.

2nd. Its various applications in disease.

3rd. To consider some of the causes of the apparent discrepancies as regards its administration.

In doing this, I must here tender my thanks to Professor O'Leary, Queen's College, Cork, for some valuable information he has afforded me on this subject—valuable especially as he has had opportunity of witnessing experiments performed by some of the first continental authorities on the drug. Before considering its active principles, and their effects, I would wish to notice, first, that there is no drug, the collection, preparation and preservation of whose leaves greater care must be bestowed on, than digitalis. The time of year, the age of the plant, are perhaps two of the most important points. Waltz, of Heidelberg, who has spent an immense amount of labour in investigating this matter, found that the quantity of active principle, present in various specimens, differed immensely. The exposed position of the plant—or, on the other hand, its sheltered one—the degree of moisture, all influence its activity, and consequently the activity of its preparations; this fact is not confined to digitalis, it is a botanical law; from all experiments it appears that the best time to collect the leaves is during June or July, when the plant is beginning to flower, and that the largest and deepest coloured are the best to select, removing the petiole and mid-rib, and carefully drying them, not tying them in bundles, as is sometimes done, as that is likely to cause fermentation. They should be kept from the action of light, in dark bottles, and in dry places, and renewed yearly. I think the odour of a bottle of good digitalis more resembles that of a canister of tea than anything I know of.

Active principles.—If now there exists, as we shall presently perceive, a variety in the active principles of digitalis, it follows that unless all tend to the same action, the effects we desire to produce would be greatly altered, their actions individually not being the same, by prescribing them together or separately. Hence, we find, in Paris, Bouillaud uses the granules of digitaline in heart affections. Let us now, therefore, consider what are their active principles, and how they differ in their respective effects. The older writers appear to have looked on digitalis as diuretic, through its sedative action on the heart promoting thus absorption. Dr. Paris so looked on it, and they rightly supported their views by pathological and physiological facts of poisons being absorbed so readily in languid circulations, and digitalis not having the same diuretic effect in health as it has in diseased states; but beyond this they do not appear to have gone, and they did not nicely discriminate between the different actions of its active principles. Now, numerous substances have been asserted to be present in digitalis—the result, perhaps, rather of the manipulating ingenuity of the enthusiastic chemist. And the names of these would be but a useless category. I think, finally, we may reduce the number to three of any importance. The two following analyses I lay before you are those of Waltz, Quevenne, and Homolle :—

ANALYSIS OF HOMOLLE AND QUEVENNE.

1°. Digitalose.—Shining, Snow-white; needle-shaped crystals; soluable in alcohol and chloroform; more sparingly in ether, turning yellow by 80°, and neutral in re-action.

2°. Le Digitalin.—Without smell or taste; freely soluable in alcohol; sparingly in chloroform; turned first grey, then brownish, by Hcl.

3°. Digitalid—Having a bitterish sweet taste; very sparingly soluable in alcohol, and electro-negative.

4°. Digitalic Acid, white; crystalline; when heated having a penetrating smell; easily decomposed on exposure to air, and turning brown; freely soluable in water and alcohol, and somewhat in ether.

5°. Antirrhinic Acid.

4°. Digitalimic Acid, closely resembling the Oleic.

WALTZ ANALYSIS.

1°. Digitalin ($C^{10} H^{9} O^{4}$).—Crystalline soft mass; freely soluble in alcohol, especially hot; sparingly in water and ether.

2°. Digitalosin ($C^{19} H^{16} O^{9}$).—An amorphous, yellowish white, extremely bitter substance.

3°. Digitalerin ($C^{11} H^{10} O^{3}$).—A yellow, very acrid deliquescent powder.

4°. Volatile Substance, obtained by distillation, closely resembling valerianic acid.

These four constitute what is generally known as Digitaline.

2. Acids: Digitalic & Antirrhinic.

Former—fixed, soluble in water and alcohol, containing no nitrogen, and having a peculiar smell.

Latter—grey, colourless, valerianic smell

3°. Pikrin, a bitter, deliquescent substance.

4°. Scaptin, a brown, acrid extract.

5°. Chlorophyl, starch, gum, lignin, tannin, salts of lime and potash, volatile and fixed oil.

Of these the three following are those, I think, of special importance. I mean, viz. :—digitaline, digitalic acid, and volatile oil; these having been isolated and experimented with.

Now, of these three, one appears to have an action peculiar to itself—the digitaline—a pure sedative, reducing the beats of the heart, and producing a slow and irregular pulse. In Homolle's latest experiments it was satisfactorily proved that from two to six milligrammes invariably caused a fall of from four to twelve beats a minute, in the heart's action, in the physiological state, and a diminution of one-half, attended with restored regularity of action in persons labouring under affections, organic or functional, of the heart.

Velpian experimented largely on dogs, which were found to be very easily affected by digitalis; and his views, that its action is especially manifested on the organic contractions of the heart, which at first lowers, and finally stops, have been confirmed by the researches of Gouleaud and Homolle. In France, during its administration, the beats of the heart have been lowered twenty in a minute by giving twenty drops, every third hour, of the tincture. The French granule of digitaline, perhaps preferable in cardiac disorders, containing fiftieth of a grain, commencing with one, and gradually increasing every sixth or seventh hour to five.

Of late, during the French poisoning trial, more particularly investigated by Hebert Homolle, digitaline was recognizable as poison by,—first, being turned brown by concentrated sulphuric acid; this gradually emerging into a dark-red colour, which latter is turned into a dirty green on the addition of water. Second.—When moistened with sulphuric acid, and exposed to the vapour of bromine, a beautiful violet hue. The poisonous effects were found to require for their production much larger doses when digitaline was given to dogs, than when taken by man. The most constant symptom first manifested, was a peculiar kind of vomiting subsequent on, and seemingly a consequence of, the extension upwardsof convulsive spasms of the extremities. These effects were found to take place much more quickly and with much more intensity when digitaline was applied to a wound or introduced into a vein. It shows its most marked effects about forty-eight hours after the dose. Paralyzing the motor influence of the heart through its action on pneumogastric and medulla oblongata, and that it has this action on the heart no one doubts. Dr. O'Leary described an instrument he saw used by Waltz for showing the reduction in the heart's action, and which reduced the fact to a mathematical certainty—the number of pulsations in the carotid of a dog being marked on a revolving cylinder of white paper, by means of a pencil of Indian ink. During his experiments it was especially difficult to obtain pure the digitaline, as most of what even the first chemists possessed was of inferior character, and different specimens showed opposite results.

The acid, on the other hand, in combination with the acrid oil, acts as a diuretic through the urino-genital organs; but we have before seen that digitalis, by its sedative effect on the circulation, is indirectly diuretic, and, therefore, we have the double action—a direct one through the volatile oil, and an indirect one through the digitaline—both diuretic.

Digitaline also dilates the pupil; it does so by acting on, first, the impulsive or radiating fibres of the iris dilating it; and, secondly, on the regularizing or circular, giving it immobility; so far then for digitalis as a pure sedative and diuretic. As regards its accumulation, it has for a long time been put down as the type of an accumulative drug. That suddenly the most dangerous symptoms are produced by its continued use, by the sudden prostration in assuming the standing posture, is clear to all; but Dr. Garrod, in his recent work, appears to doubt this—I mean its pure cumulative powers—and attributes these properties to its imperceptibly weakening the heart's action, and this continuing and increasing beyond a certain point; when suddenly are felt those effects which follow its continued use. Others, as for instance, Dr. R. Macnamara, considers it is accumulated in the system, developing its poisonous qualities when that accumulation goes beyond a certain degree. The fact, at least, remains to warn the practitioner that its continued use, even in cases favourable for its administration, is attended with danger, and that his patient should be carefully watched. That indirectly it arrests plastic exudations, by lessening the force of the circulation, is evidenced in inflammation of the lungs and pleura.

We may now consider those affections in which it is more especially used in the present day. Time would not allow more than a superficial glance at all; therefore, I shall consider one or two, more particularly as those of most importance, and cursorily glance at others. In heart affections, and the two great classes of those organic in character—mitral and aortic—with or without hypertrophy, we find that hypertrophy being a natural method of cure, and seldom occuring, *per se*, but accompanied with dilatation. Here digitalis is indicated when we relieve the necessity of curing the hypertrophy, which we do when we lessen the flow of blood through a narrowed orifice, as in aortic narrowing; but in mitral insufficiency this is not our object; we want force to drive the blood to the different extremities, and then digitalis *only* can have a poisonous effect. And then arises the question how does digitalis act on the heart? All are aware of the extensive communication existing between the pneumogastric and sympathetic nerves, through the cervical ganglia of the neck and cardiac branches; the final ramification of these being entwined round and buried in the substance of the heart itself. And also of the dependence of the rhythm of the heart, and its cause being asserted to be owing to the due working of these ganglia; so many small centres, like the Fenian ones of our own day, on which depends the proper working of the *head-centre* of the heart. Now, a stimulant applied to the floor of the fourth ventricle retards the action of the heart, and effects vary with the amount of that stimulus; I mean an increase or decrease of its action; and looking on the rhythmical action of the heart, as dependent on the healthy state of these three parts, viz., medulla, pneumogastric, and sympathetic system; we see how that digitalis, by its acting directly on these, will control palpitations and intermissions, functional in their character, by its influence on the ganglia in the heart; and also that in organic disease its action on the heart, that we desire to produce, is attributable to its effect on the medulla and sympathetic nerves. Dr. Rawdon Macnamara, in his last admirable edition of Neligan, says it is contra-indicated in organic diseases of the heart, attended with hypertrophy and dilatation; but seeing that hypertrophy and dilatation go hand in hand together, one or other in preponderance, as the hypertrophy is great or otherwise—and that if we reject its use in every case where these two are present, we shall then limit our use of it to mere functional derangements only, and diminish to a great extent the therapeutic value of digitalis. In aortic aneurisms it keeps the evil day off by its effect on the circulation. Inflammation of the lungs and pleura are benefited by its lessening the flow of blood through them and impeding exudations. In febrile conditions, and in dropsies, especially those, I think, complicated with heart affections, where a vegetable diuretic, non-stimulant in its character, is indicated. And here, I think, the infusion is the form most preferable to administer, as it contains nearly all active principles, sedative and diuretic, combining effect on heart and kidney. In pulmonary hemorrhages, too, its efficacy is undoubted. Also externally, as an application to neuralgic parts, acting, perchance, like other alkaloids, on the sentient extremities of the nerves of the part. And now we gradually merge into those nervous affections that digitalis is of use in; but, before noticing these, I would glance, in passing, on the action of digitalis in menorrhagia, as first noticed by Drs. Robert Lee and Dickinson. They observed that it checked the bleeding, and they attributed its effect, not so much to its action on the circulation, as to a direct action on the fibres of the uterus itself. Now, we know that the involuntary fibre-cells of Kölliker compose the great bulk of the uterus, developed into non-striated involuntary, in the pregnant condition, whereas those of the heart are striated. The nerves that supply the uterus, derived from the aortic, spermatic, and hypogastric plexuses of nerves, branches from the latter, accompanying the uterine arteries, doing so into the substance of the uterus itself, ganglia being detected on these. And Dr. Tyler Smith, in speaking of the nervi-motor functions of the uterus, says:—There can be no doubt that it is supplied with incident motor nerves, and that the various reflex actions of the uterus are proofs of the communication of these nerves with the pneumogastric and other nerves. The uterus, like the heart, has been shown at times to have a peristaltic action, and like it, rhythmically, has been known to contract in a manner similar to the heart; and Dr. Smith goes on to say, that from the connexion of the two splanchnic nerves with various plexusses, abdominal and pelvic, it is quite possible for nerves to reach the uterus from high up in the spinal cord (and thus from the medulla itself); and he also shows how that the state of the circulation, by influencing the spinal centre, and thus the nerves issuing from it, must effect the contraction of the uterine fibres, be that an anemic or hyperemic state; in either case, increased action is the result, though in the former case the force is soon exhausted.

Now may not we attribute the action of digitalis on the uterus to a sort of double action. 1st. To the nervous influence transmitted from upper part of spinal cord and medulla, thence through splanchnic and other nerves, and through them to the sympathetic ganglia distributed on the walls of the arteries in the uterus, causing them to contract, rather than to a direct action on the muscular fibres of the uterus themselves. 2nd. By its influencing the state of the circulation in the spinal centre, and causing those fibres to contract. Dr. West says that the effect does not always take place, and that it is in cases of uncomplicated menorrhagia that it has its best effect; as also that the hemorrhage has continued unabated in some instances though the digitalis was pushed as far as prudent.

Entering into the vexed question of a classification of delirium tremens, and how digitatlis can act in it, would be at present a discussion that would occupy too much time. We know, on authority we ought not to doubt, that it has been given in delirium tremens, and apparently with good effect, as by Dr. Jones, of Jersey, a greater discrepancy still existing as to what dose it should be given in, and in what particular cases it is of service. Looking at the pathological appearances after death from delirium tremens, we find that it is the result of no decided lesion of the brain. We do find congestion, solidification, serous infiltration; but these may be the result of secondary consequences of the disease itself—of cerebral or meningeal inflammation that has set in as a complication; and here, too, notice must be taken of the fact, that other diseases are likely to be present in your habitual drunkard or hardened tippler—such as Bright's—and that complicated with heart affections, gastric and hepatic, and lung derangements; and we must see that death ensues from these complications as much as from the disease itself. Looking, therefore, to the fact that digitalis, in its ordinary effects, does not tend to check the state of things existing in delirium tremens, such as the *copious urine*, *dilated pupil*, *peculiar pulse*, *moist skin*, but rather to increase them in that class of cases where cerebral complications are not indicated, the question naturally arises why give it? Dr. Wood says "That there is no doubt that, could we look into the interior operations of a brain of a patient in delirium tremens, we should see the springs of the organ everywhere relaxed, its machinery moving languidly and feebly. Though the apparent results at first, indeed, look like over excitement, but, on carefully considering them, we see that it is not so; the heart may beat quickly, but it does so feebly; muscles jerk spasmodically, but it is with a universal tremor." Now, I think, with these facts before us, and the acknowledged actions of digitalis clearly laid down, it would appear that it is only in a certain class of cases that it is indicated; I mean only in those cases in which, from what I can gather, two other grand remedies are inapplicable—I mean *opium and support.* In those cases, arising in whatever manner they may, or from any cause, though there can be little doubt that external circumstances will alter both the nature and character of the delirium; let the patient even be greatly prostrated, yet, if by the scanty urine, peculiar pulse, contracted pupil, and delirium, we are afraid cerebral inflammation or excitement is running high, and that opium is contraindicated; then, I think, digitalis as a vascular sedative, perchance, or by its influence on the coats of the arteries, will have a beneficial effect; and all this time we must not forget that complications, existing in other organs, must deteriorate from its value as a remedy at one time, or augment its effects at another; as also that the dose must vary in individual cases, and that opposite results ought to be looked for from extreme opposites in the quantities administered; and finally, that the fact of alcohol causing congestion of the blood in the brain and elsewhere, a portion of it remaining unchanged in the blood, and the change in the urine in delirium tremens, are all points requiring careful consideration before venturing an opinion on its use. At least I think we may conclude that, like all asserted specifics, the danger is in too blind a reliance on its virtues rather than a careful discrimination of its bad effects.

In epilepsy it has been used successfully and otherwise; and recently Dr. Corrigan cured cases, in conjunction with Dr. Macnamara; giving it as infusion, in large doses in full, till its effects were produced on the system. In considering its action, for which I have not time now left to do so carefully, we must remember that as it has succeeded or failed so also have numbers of others supposed to be specifics in this disorder, and that various as have been the assigned causes of epilepsy so also have been remedies proposed; and whether it be that in those cases of a successful issue the result depended on some eccentric irritation, as derangement of the heart, uterus, or other organ, or that it was centric the result of over excitation of the brain and excess of supply of blood, digitalis, in the one case relieving the patient by its direct action on the deranged state of the organ, be it uterus or heart in the other, the over-stimulated brain, by its sedative action on the circulation, I think has not been up to this time exactly determined. The, as yet, complicated and feebly understood connexions of the nervous system with organic life, leaving many points, at least, guess-work, medicine not being reduced to a positive science leaves us groping as regards the administration not alone of digitalis but of other drugs. Its acknowledged efficacy in mania, too, of late years, seems strongly to point the attention of the profession to it in many cases as a remedy worthy of trial, and statements of cases in which it has been tried would be very desirable. A medical friend related a case—one of catelepsy—that recovered, in which he gave digitalis. All these facts points strongly to digitalis as a grand remedy in that incomprehensible web of nervous disorders. I think, arriving at the last point in the consideration of this drug, we may class the discrepancies as regards its administration under three heads:—

1st. The improper preservation of, and collection of the leaves, either at a period of growth, when they are comparatively useless, and consequently rendering the preparations so, it is evident that under these circumstances half an ounce of the tincture taken might act only as so much stimulant due to the spirit used in its preparation; and the medical man, invariably continuing the use of that same tincture, would indignantly ignore the danger of its exhibition in other cases; so again various other causes may render them comparatively inert, or, on the other hand, powerful; and the practitioner who, with one infusion or tincture heroically dosed his patient, might, arguing from its efficacy, have but a sorry tale when he tried the same dose on another.

2nd. That it has not been applied strictly to those cases alone in which it is indicated, the exact conditions necessary for its administration not being properly as yet classified.

3rd. That there may be a peculiar idioscyncracy of constitution which may render it, as in the case of other drugs, capable of being borne, on the one hand, or acting as a poison on the other.—*February* 13*th*, 1866.

A Remarkable Case of Pneumothorax, without Perforation, under the care of E. R. Townsend, jun., M.D., T.C.D.

Henry Welstead, aged 19, an iron-founder's apprentice, was admitted into the South Infirmary and County Cork General Hospital, February 23rd, 1865. History.—About two years ago he suffered from a pain in the left side, and spat some blood; has had a cough occasionally since, particularly at night; thinks he has lost flesh lately. About fourteen days previous to his admission a pain came on suddenly in his left side and shoulder, and continued up to the date of his admission into hospital, dyspnea and cough attending it. Symptoms on admission:—Complains of cough and great difficulty of breathing; is very feverish; pulse 110; tongue loaded; has no appetite, and sleeps badly; decubitus on the back; there is a red line round the gums, and incipient clubbing of the fingers; respiration seems to be carried on entirely by the right side, the left not expanding at all, but being bulged forwards; and the ribs, during each act of respiration, are dragged over to the right side in a peculiar manner, owing to the increased action of that side; to the eye there is a manifest increase in size of left side, which, on measurement, proved to be larger than the right by nearly half an inch; percussion elicits a marked tympanitic resonance over the entire of the left lung anteriorly and laterally; the sound over the cardiac region is as clear as over the rest of the side; there is total absence of all vesicular breathing and vocal resonance; there is no metallic sound of any kind; heart displaced, and beating quite distinctly fully two inches to the right of the sternum; sounds perfectly natural, and cardiac dulness clearly defined on the right side, by percussion; posteriorly percussion over the scapular region of the left side gives a dull sound, with tubular breathing and obscure crepitation immediately under the angle of the scapula, and over the root of the lung—with bronchopheny; from this point downwards there is marked tympanitic resonance; there is puerile respiration over the right side, which sounds well on percussion, but is dull when compared with the left side anteriorly. From these symptoms and signs it was evident that a quantity of air occupied the cavity of the left pleura, which had compressed the lung against the spinal column into the posterior mediastinum, and had displaced the heart to the right side. Treatment:—He was ordered five-grain doses of iodide of potassium, three times in the day; to have beef tea.

February 26th.—The entire of the left side to be painted with strong iodine paint, and to take five grains of Dover's powder, twice in the day, to allay the cough and restlessness; to have two glasses of wine in the day, with beef-tea. This treatment was continued up to March 2nd.

March 4th.—Tongue beginning to clean; heart appears to be approaching the middle line of the sternum—is still very weak; the tympanitic resonance is now much less than on his admission, and his breathing easier.

March 7th.—On changing his position from the supine to the prone, the percussion sound towards the base of left lung posteriorly became somewhat clearer; while at the apex, the dulness remained the same; and anteriorly over lower lobe and precordial region, which were morbidly clear; when the patient remained supine, slight dulness became apparent, indicating the presence of fluid; in the pleura there is no amphoric sound whatever heard, and no vesicular breathing anteriorly, and no succussion sound; but the patient is too weak to try for this symptom again, at present; posteriorly there is no harsh vesicular breathing heard on a forcible inspiration.

March 9th.—Left side beginning to act; during inspiration air is beginning to pass into the left lung; anteriorly the lower ribs on left side expanding slightly during a full inspiration; the upper remaining stationary, causing a peculiarly distorted appearance, as if the subclavicular region was flattened; there is obscure crepitation over lower lobes anteriorly; posteriorly harsh vesicular breathing is now becoming established where tubular breathing and crepitation were previously heard.

March 13th.—The bulging of the left side has visibly subsided; the right now looks larger than the left. Measurement of left side, from centre of sternum to spine, during full inspiration, 16 inches; of right side, during inspiration, 16¼ inches. He is daily improving, gaining strength, and feels his breathing less difficult every day; the feverish symptoms have disappeared; the cough and expectoration are decreased.

March 16th.—To have syrup ferri. iodidi ʒ ii. added to his iodide of potassium mixture; to omit the pills at night, and to take half an ounce of cod-liver oil twice a day; this he continued until April 11th, when, as he again complained of perspirations at night, and troublesome cough which prevented his sleeping, I ordered him morphia and gallic acid.

April 17.—The action of the left side has been gradually restored; the obscure crepitation which was first heard over the lower part of the left side anteriorly, passed gradually into well marked redux crepitus, which was again succeeded by vesicular breathing, the heart having previously returned gradually to its normal position, the sounds being quite natural; the bulging of the left side has now quite disappeared, and the morbidly clear and resonant sound has given place to a comparatively dull note, especially at the apex of the lung under the clavicle, where there is well marked tubular breathing; this was succeeded after a little time by distinct moist crepitation, heard both with inspiration and expiration; there is now very apparent flattening of left side superiorly, under the clavicle, and extending to the third rib; from this point the ribs expand well, particularly the false ribs.

April 29.—Omit wine; to have a pint of porter instead. April 30.—A blister to be applied under left clavicle. April 22.—To have an anodyne draught at night, the gallic acid and morphia pills having confined the bowels; these draughts, with cod-liver oil and iodide of potassium, and iodide of iron mixture, he continued to take up to May 20; when, feeling nearly well, and quite strong enough to go to work, he left the hospital, saying he would go to the sea-side for a month before recommencing his work. His weight on leaving was seven stone twelve pounds, having increased nearly half a stone since his admission, nearly three months before. He was not weighed until after he had been up some days, so that he must have increased more than this in weight from his first admission; but as he did not know what his weight was before his illness, we could only judge of his increase from the time he was weighed in hospital.

On hearing the symptoms and history of this case previous to his admission, namely, acute pain in the left side, great difficulty of breathing, with short cough, and considerable fever, I thought the case was probably one of pleuro-pneumonia, with effusion of fluid into the left side; and inspection seemed to confirm this opinion, as whilst the patient lay on his back there was complete immobility, with increased size of the left side, the intercostal spaces being bulged forwards, and the heart was seen pulsating considerably to the right of the sternum; but percussion soon modified this opinion—the entire left side yielding a loud tympanitic sound, so loud and resonant that the right or sound side appeared, when compared with it, to be quite dull, although percussion over this side gave a perfectly healthy clear note when taken by itself. On applying the stethoscope to the left side of the chest, no vesicular or other breath sounds were audible anteriorly or laterally, though most carefully looked for; there was no vocal fremitus, and no amphoric or metallic sound whatever. Over the scapular region and root of the lung posteriorly there was dulness on percussion and tubular breathing, with obscure crepitation and well-marked bronchophony; these symptoms were at first very puzzling, and the conclusion I arrived at after careful consideration was that the case was at first one of pleuro-pneumonia—the pleura being more engaged than the lung itself, and having secreted air instead of fluid—which air, being generated in large quantity, had compressed the lung into the posterior mediastinum and dislocated the heart to the right side; there was no indication of fluid at all on his admission, nor did change of position alter the percussion sound as it did subsequently; this case is, in fact, almost identical with the remarkable case published by Graves in his *Clinical Lectures* (page 496, new edition), from which I take the following extract:—

"I was called by Dr. Dwyer to visit a young gentlemen affected with cough and mild feverish symptoms; indubitable evidence was afforded, by the stethoscope and percussion, of a considerable portion of the lower lobe of the left lung being on the verge of hepatization, for there were dulness, bronchial respiration, and very obscure crepitus, with bronchophony, over the affected infero-posterior portion of the lungs; in no other part of the left lung whatever was there dulness; indeed the reverse was observable even in its infero-anterior portion, which gave a preternaturally clear sound, particularly in the region usually occupied by the heart; it was evident that no effusion of fluid existed in addition to the pneumonia detected at the base of the left lung; on closer examination we were, therefore, greatly surprised at finding that the heart was pushed out of its place, and pulsated quite close to the mamma on the right side. In this case the heart was dislocated, and yet not a single physical sign of the presence of fluid in the left side existed. He continues—there is no other way then of accounting for the latter phenomenon except the supposition that the heart was pushed out of its place by air effused into the left pleural sac, in consequence of a certain degree of pleurisy accompanying the pneumonia of the left lung; the physical signs such an occurrence must necessarily give rise to would perfectly agree with those observed; it is important to add, that the inflamed portion of the left lung now went through the usual process of healthy resolution, but that the heart had regained its natural position many days before the resolution of the pneumonia was completed; an occurrence we can readily explain on the natural supposition that the absorption of the effused air was a process more easily and readily performed by the pleura when its inflammation was cured; there was the restoration of the lung to its original healthy structure after the pneumonia had been checked."

The progress of resolution in Welstead's case was almost exactly similar: the air was first absorbed, the heart returned to its normal position, and the lung gradually underwent resolution; the symptoms and stethoscopical signs exactly corresponding to those exhibited by a hepatized lung undergoing resolution. Dr. Graves in his cases considered that the air in the pleural cavity was secreted by the pleural membrane itself, and was not due to perforation of the lung; this opinion of his has given rise to much controversy. Stokes, in his work on the chest, seems to endorse Graves' opinion, and gives a case, the only one he had then met with, in which a tympanitic resonance on percussion was found to exist on the eighth or ninth day, in a case of pleuro-pneumonia over the antero-superior portion of the left side, where, on the previous day there had been complete dulness; on the next day the tympanitic clearness had extended to the postero-superior portion of the chest; the tympanitic resonance subsided in a day or two, leaving the chest again dull, with absence of vesicular murmur. He continues—the resonance in this case could not have been due to the effects of a distended stomach, as it only existed in the upper portions of the chest, and the region of the stomach was never tympanitic.

Dr. Walsh, in his work on the lungs, third edition, page 82, says, true tympanitic resonance is excessively rare over pneumonic consolidation; and I have scarcely ever observed it at the upper part of the chest where pleural fluid had accumulated below. When such resonance occurs at the base of the chest great distention of the stomach or colon might be suggested in explanation; but, in point of fact, the stomach and colon are rarely distended enough for the conversion of their common amphoric into tympanitic quality; and in the only two possible instances I have observed of pneumonic tympanitic sound, the consolidation was on the right side above the liver. *Can the phenomenon* depend on *temporary secretion of air* by the *pleural sac?* An explanation of the infra-clavicular tubular note, in pleuritic effusion, originating with Dr. Hudson, has generally been accepted in this country. He looks upon it simply as the natural note of the trachea and main bronchus conducted to the surface by the pushed up and condensed lung. And I believe that the trachea does sometimes exercise this influence, just as it will where a mass of enlarged bronchial glands bridges the space between itself and the surface. But this explanation is utterly inapplicable to all cases. What light does it throw, for instance, on the occurrence of tubular note at the right posterior or lateral base.

In the *Dublin Quarterly Journal* for 1863, Dr. Little, of Sligo, has published a very interesting and remarkable case of pneumo-thorax without perforation of the lung, rapidly consecutive on simple hyper-acute pleurisy, in which a careful *post mortem* examination showed that the lung was perfectly free from tubercle, and was quite healthy; there was no perforation whatever. He concludes his most interesting and valuable paper by remarking that he believes his case offers the first perfectly satisfactory solution of an old pathological puzzle—satisfactory in all its details, in its history, physical diagnosis, and especially in the clear and unmistakable evidence, furnished by a careful *post mortem* examination; and that, in his opinion, not a link is wanting in the chain of demonstration that in certain cases of inflammation of the pleura (which must be exceedingly rare and exceptional), that membrane is susceptible of taking on a peculiar morbid action whereby air is copiously secreted into the pleural sac, inducing a rapidly fatal form of that disease which he designates simple pleuritic pneumothorax.

In opposition to these views, I may say that Drs. Alison, Fuller, and nearly all the late writers, as well as Drs. Haughton, Williams, and many of the earlier writers on this subject, when enumerating the causes of pneumothorax, all mention the secretion of air by the pleural membrane, as one of the sources from which air may be effused into the pleural cavity—but do so solely on Lænnec's authority; and all seem to be opposed to the possibility of its occurrence, except Walsh, who admits the possibility of it in rare cases of pneumonia; this shows the extreme rarity, at all events, of such a result of pleuritis. These authors consider the cause of the disease to be perforation of the lung from some disease within the lung itself—most commonly tubercular ulceration; they are all, therefore, unanimous in looking on the occurrence of pneumothorax as an universally fatal complication, the patient usually dying within a space of a year and a-half, at the outside. Dr. Gairdner, in his Clinical Medicine, whilst holding the same views as to the cause of pneumothorax being almost always due to perforation of the lung, yet differs from all the others in considering that pneumothorax, especially when limited in extent, is not a necessarily fatal occurrence.

He relates a case of pneumothorax, published by Dr. Thorburn, of Manchester, in which extensive pneumothorax existed on the right side, which gave rise to very little suffering or inconvenience, and was not accompanied by any cough. The patient was a healthy young man, and never exhibited any symptoms of tubercular disease. He perfectly recovered, and his chest, when examined some months afterwards, appeared to be perfectly healthy.

Dr. Gairdner, in commenting on this case, which he had himself examined, says, what happens in cases like this is—that the lung previously affected or not with tubercle, emphysema, or other form of lesion, weakening at points its power of resistance, gives way by a mere pin-hole perforation, through which the pleura would rapidly enough become quite distended with air were it not for the pre-existence, in some cases, and the very rapid formation in others, of pleuritic adhesions, sufficient to limit the consequences to a part only of the cavity. In most cases, too, there occurs a new pleuritic attack, the result of the pneumothorax, by which the opening, when small, is often sealed up long before the pleura has become full of air, to a degree productive of the most extreme form of suffering from dyspnea. In some instances again, and especially in those of tubercular cavities, proceeding to perforation, he has seen reason to believe that a little air may gain the cavity of the pleura by transudation without an actual perforation, the serous membrane having its vitality weakened so as to exercise little more control than a dead tissue over this mechanical transudation. He bases this inference chiefly on a single instance in which it appeared to him evident that a small quantity of air had so escaped—the case being one of tubercular disease in which pneumothorax was not suspected during life, and death seemed to have caught the disease in the very act of perforation as it were by a mere coincidence of time. In other instances he has seen two or even three successive perforations in the same lung, the last of which only has proved fatal, the others having been sealed up shortly before the death of the patient by the effusion of soft lymph. He is thus led to consider pleurisy in its relation to pneumothorax as not a fatal but a healing power, as it tends to limit the extent of the pneumothorax, and is thus an effort of nature to cure the disease by sealing up with lymph the small perforation. He refers to Graves' case also as an instance of recovery; but considers the case somewhat imperfect in its details. He continues:—"Dr. Thorburn's case is, as I have said, unique in respect of the distinctness of the clinical facts, unless it be matched with a case recorded long ago by Graves, but afterwards involved in doubt, from the objections raised by Dr. Williams to the theory of diagnosis of the Irish physician. There can hardly be a difference of opinion now-a-days as to the insufficiency of the evidence of pneumothorax in most of Dr. Graves' cases; and it is, perhaps, no less difficult to accept his theory of the simple secretion of air into the pleural sac; yet, I am much disposed to think that this one case, at least, is safe from criticism as to the diagnosis in respect of the evidence stated to exist, of displacement of the heart quite to the right nipple, and its recovery afterwards of its normal position." As there is no mention of metallic phenomena whatever, and as the case is somewhat imperfectly related, considering its vast importance, it may be, on the whole, safer to consider it as being not quite conclusive.

In my opinion the absence of all mention of metallic phenomena renders the case most important, as it tends to confirm the opinion of Graves that the case was one of secretion of air by the pleura, and not of perforation—the occurrence of the metallic tinkling being pathognomonic of that lesion; and if it had been present could scarcely have escaped the observation of Dr. Graves.

Dr. Alison, speaking of the physical signs of pneumothorax, says:—"Tympanitic percussion sound of perforation is generally accompanied with other signs declaratory of the accident; I may say that in every example other signs must have existed at one time or another, so generally is this form of percussion associated with amphoric respiration or voice, with metallic tinkle, ranging over a great area, with splashing sounds and comparative immobility, that, except in an exceptional case, which one has some little difficulty in conceiving, I should be disposed to regard tympanitic resonance, though highly suspicious, as inconclusive of the presence of perforation, without the combination of one or more of these other signs."

The tinkle of perforation is generally present without intermission in perforation of recent occurrence; when perforation becomes chronic, and the patient lives long, which is occasionally the case, the tinkle may cease for a time, just as the amphoric blowing may do; and this I am disposed to believe, though I am by no means certain of it, depends upon the closure of the aperture, it may be temporary; either by cicatrization, or by occlusion by means of lymph or mucus; in one case both the amphoric blowing and the metallic tinkle were absent for weeks or months—they had been heard a year before death, and also immediately before it. As I have said before, neither amphoric resonance nor metallic tinkling were ever heard in Welstead's case, though most carefully looked for; I must therefore say, that after carefully considering all the arguments on both sides of this question, I have no doubt but that this case was a case of phneumothorax without perforation of the lung, although the patient was of a phthisical appearance, and had evidence of tubercle in left lung; before leaving hospital this, I believe, was deposited in the apex of the lung when condensed by pressure, and was probably induced by the pneumonia; except for the occurrence of which he might have escaped the tuberclar disease.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COLLEGE OF PHYSICIANS.

Dr. Beatty, President.

Dr. John A. Byrne read the following history of a *Case of Puerperal Fetid Pulmonary Abscess* which he had met with, and which possessed some interest on account of its rarity as a puerperal complication.

Mrs. T——, was confined on September 22nd, 1863, at 9 a.m., having been in labour about ten hours; according to the statement of the nurse-tender, the labour pains had commenced at 11 p.m. on the previous night. When I saw her at 4 o'clock a.m., the membranes were ruptured, the os uteri was fully dilated, the head was in the first position, and everything appeared to be going on in the most favourable manner; the pains still continued; and at 9 o'clock a.m. she was delivered of a very fine female child. There was some *post partum* hemorrhage, which yielded to active measures; but this did not appear to make any impression on her pulse, and she soon recovered from it, and appeared to progress very satisfactorily.

There was nothing during the whole of the second stage, which extended over about five hours, viz., from 4 to 9 a.m., that was calculated to excite any alarm or uneasiness; the pains were moderately strong. She was a primipara; and although there was not much interval between the pains, yet, the continuance of the second stage for this time did not seem to produce any symptoms of exhaustion, such as the obstetric practitioner is so often familiar with, and which cause him so often great anxiety of mind. Thus, her pulse remained quiet; her skin cool; her tongue clean; the vaginal discharge normal, there was no retention of urine; she exhibited considerable tranquillity of mind; and she was, to all appearances, a fine, healthy, well formed-woman.

I am particular in dwelling upon this circumstance as it might possibly be supposed that the train of symptoms which afterwards exhibited themselves in this case depended upon or were referable to exhaustion, produced by a too long protracted second stage, a circumstance which, as I have before stated, every accoucheur of experience must constantly meet with; but I had not the slightest uneasiness on this account, as I had not left the lady for a single moment until she was delivered, and, consequently, could form a most exact opinion as to the frequency and duration of every single uterine contraction, the progress of labour, and the effect of the labour upon the life of the child; and, I need scarcely assure my listeners that this is one of the most important duties which devolves upon the practitioner in such cases; and that the responsibility of judging accurately, and balancing nicely the strength of his patient, and the effect of the labour upon the child's life, against time, is one of the most difficult and important functions which he has to discharge.

The lady, as I have stated, was a very fine well formed women. Her age was about thirty; she had dark hair and dark eyes, and appeared to be of the bilious temperament. I afterwards learned that she had been under the care of an eminent medical man in this city, for an affection of the liver; and in my interview with her before her confinement, I perceived that she was very desponding and low spirited about the approaching confinement; and she told me frequently that she was certain that she *would never survive it.* I need scarcely say that I used my best endeavours to remove those impressions or fancies by laughing them off; but they continued to haunt her, and never left her for one moment after her confinement.

She appeared to be going on very well until the 24th September, the third day, when she had a slight rigor; and this was followed by pyrexial symptoms, and she complained of some pain over the left iliac and suprapubic regions; this pain was increased by pressure; it was not, however, very intense, nor was there well-marked metritis. Fomentations and poulticing, with an opiate, having failed to remove it—and the pyrexia and uterine tenderness still continuing, she was ordered ten leeches to the uterine and iliac regions, and to be poulticed, and some grey powder with ext. opii. and James' powders, to be given every third hour.

September 25th, fourth day.—She is somewhat relieved of the pain; the pulse is 108; she did not sleep well, and there is an irritability of manner about her, and a wild appearance which made me apprehensive. I ordered her to be still poulticed, to continue the powders, and to have, at night, an anodyne, containing solut. morphiæ, half drachm; dilute hydrocyanic acid, 2 drops; camphor water, 6 drachms.

September 26th, fifth day.—She had no sleep; abdominal tenderness removed; pulse 108; pyrexia; there was some diarrhea. Ordered to stop the powders, continue poulticing, and an enema containing 30 drops of acetum opii to be given at night; chalk powder with opium to be given at night till diarrhea ceased.

September 27th, sixth day.—Had no sleep whatever; manner very wild and excited; pulse 108; talks incoherently; is very desponding; manifests no care for her infant.

On this day she complained of a stitch in the right side, at the lower part of the lung, posteriorly, and she had a slight cough: there were no physical signs of any pulmonary or pleuritic affection.

She was ordered a small blister to the side, and some extract of hyoscyamus every three hours, and a draught containing 25 drops of chlorodyne.

I proposed to her husband to have a consultation to-day, as I did not like her condition; accordingly my friend, Dr. M'Clintock, saw her with me, and we ordered her solution of morphia, 25 drops; dilute hydrocyanic acid, 2 drops; distilled water, 6 drachms—to be taken at night, if necessary.

On the 28th, seventh day.—Still no sleep. Pulse 110; there is great excitement of manner; no care for food; she talks incoherently; no abdominal pain or tenderness. I cautioned the nurse and those about her to watch her most carefully, as I suspected that something would happen; and at 8 p.m. she uttered a loud piercing scream, and became maniacal, and required the efforts of those about her to prevent her getting out of bed and doing injury to herself.

We saw her in the evening, and ordered her chlorodyne, 45 drops in draught, and to have nourishment at regular intervals during the night, in case she did not sleep.

September 29th, eighth day.—Dr. M'Clintock saw her this morning with me; she had passed the night without one moment's sleep—in screaming, scolding, swearing, and reviling all about her. She refused nourishment; in fine she was in a state of mania such as is familiar to the accoucheur, and none of the signs of it were absent. I need not say that her friends were in a state of great alarm, not believing it possible that such a train of events could take place.

She had now passed many days and nights without any sleep whatever, although anodynes had been given to her; and the necessity of producing sleep was manifest. We accordingly prescribed Battley's sedative liquor of opium, 1 drachm; antimonial wine, 1 drachm; simple syrup, half an ounce; camphor water, 6 ounces—2 tablespoonfuls to be taken every 3 hours till sleep be produced. Muriate of morphia, 1 gr.; simple syrup, half drachm; with camphor water, in a draught, to be given at midnight, if she did not sleep before that time.

Dr. M'Clintock and myself saw her at night, and up to that time she had not slept; towards midnight, however, she became more tranquil; but the nurse to whom we had given express directions not to give the draught if she were better, did give it to her, and on our arriving the following morning we found her completely narcotized; the nurse informed us that she had been in this state for some hours; and we then became aware of the fact of the draught having been given, contrary to our express directions; she lay breathing heavily, her pulse was slow, her pupils contracted, her face congested; she was fully under the influence of opium; and it required long-continued efforts on the part of Dr. M'Clintock and myself to rouse her from this condition, by mustard, emetics, slapping of the hands, soles of the feet, and the administration of brandy, &c., &c.

After some time we were successful, and she became restored; and from that moment she lost all her *maniacal symptoms*, and she slept. She, however, continued depressed, and she complained of pain in the right side, where the blister had been applied; this pain had been masked by the occurrence of the maniacal symptoms, and as soon as they subsided it again developed itself.

She had a troublesome cough. On examining the chest we could discover nothing wrong, except some slight dulness over the inferior part of the lung, and some mucous râles.

She was ordered another small blister and poulticing to the side, with anodyne expectorants, and claret, and beef-tea were freely administered.

The cough continued; from this period it was of a short hacking character; her breathing, occasionally hurried, at no time presented dyspneal characters; nor was there any physical sign either of pneumonia or pleural effusion. She slept at night, except when disturbed by cough; there was slight expectoration occasionally, and she usually lay on her right side; her pulse, however, retained its character; she began to suffer from night perspiration, and her face had a hectic flush; and she complained of nausea, which was produced, as she said herself, by a horrid smell coming into her throat. This was not perceptible to the attendants for some days, but gave herself considerable annoyance, and created a repugnance to food.

This state continued for several days; when on October 17, at midnight, she was attacked by cough and great dyspnea; and these symptoms were followed by the discharge of a most fetid expectoration. This continued during the greater part of the early morning, and on my first visit the nurse showed me a large vessel nearly filled with it. On entering the room the fetor was so abominable that I was nearly sickened by it.

Character.—The matter expectorated was of a greenish colour, of the consistence of thick cream, and resembled pus discharged from an abscess. There was no appearance of blood either then or subsequently in it, but some dark-coloured streaks were apparent, and the fetor possessed an indescribable character. It had a most penetrating odour; to my sense it appeared more like the smell of putrid macerating flesh than anything else; but indeed I am not aware of any smell to which I could compare it. The nurse stated, that after the cough and dyspnea had continued some time she threw up this matter, and it appeared to give her much relief.

The nature of the case was now, indeed, manifest, and I had the advantage of a consultation with Dr. O'Reilly, who agreed with me in the view which I took of it.

The treatment it is scarcely necessary to detail at full length; it consisted of wine, ample nourishment, poultices to the side, and antiseptics.

October 28.—During the last twelve days there has been very little change. Occasionally she had a remission of the symptoms; then she took considerable nourishment. She slept well on some nights, and for some days she would remain almost free from cough, dyspnea, and expectoration; but her face began to assume a hectic appearance; her pulse remained always above 100, and the intolerable smell always permeated the atmosphere of the room, and the fetor was always most offensive to herself. She would seem to all appearances to be getting better, when she would suddenly be attacked by cough, vomiting, great difficulty of breathing, and she would then expectorate a large quantity of this horribly-smelling matter. This would be followed by great exhaustion, which would subside, and for some days she would remain cheerful, free from cough, and only expectorating small quantities of matter; and this went on.

About this time a small subcutaneous abscess showed itself on the inner side of the knee, which, when opened, discharged a healthy-looking pus. She was removed to the country.

October 29.—On this day Dr. Stokes saw her in consultation with me. Her condition was as follows:—

She had been in the country for a few days, and appeared to have derived some benefit from the change. However, on the evening of the 28th the dyspnea and cough returned, and the paroxysm was so violent that the attendant thought she would expire, when she ejected the full of a large tea-bowl of matter. This was partly by vomiting and partly by coughing. It was retained, and shown to Dr. Stokes, who was at once struck by its appearance, and the peculiar fetor.

She then obtained relief, and at our visit she appeared progressing.

Dr. Stokes examined her chest most carefully, and the physical symptoms did not reveal much. There was only dulness over the inferior part of the right lung, and some mucous rales; there were no signs of enlargement of that side, nor any of compression of the lung, nor of consolidation, nor of large cavity. Respiration was heard over the greater part of the lung, and râles over part of the left lung. Her pulse was 120; her respiration tranquil; her skin covered by greasy perspiration. She sat up in the bed and conversed cheerfully. Her appetite is good; she takes wine, porter, bark, &c., &c., and as far as appearances would indicate, she does not suffer from such a terrible disorder.

In examining her chest a small abscess was seen over the lower part of the spine.

It is not necessary to peruse the history of this case further. It is sufficient to say that she gradually sank, and died on 25th December, just three months from the date of her confinement.

Her death was the result of exhaustion, produced by such a long continued drain upon her system, and she expired after one of the attacks of dyspnea, and expectoration of fetid matter.

There was no autopsy permitted, so that I had no opportunity to detail the condition of the lung, &c., &c.

Remarks.—The case which I have related to the society, in my opinion, possesses many points of interest—and with its permission I will direct attention to them as briefly as possible:—

1. The mania being symptomatic of blood poisoning.
2. The sudden cessation of it.
3. The occurrence of the phlebitic abscess in the pulmonary textures.
4. The termination in gangrene of the lung.

Although real mania did not develop itself until the seventh day, yet one of the most characteristic symptoms was present almost from the commencement, viz., sleeplessness, and required the exhibition of opiates. There can be no doubt, when we take into account the rigor, the pyrexia, the pain over the lower part of the uterus and iliac regions, of the existence of inflammation in the appendages of the uterus; this yielded very quickly to treatment, and mania showed itself whilst mischief was being brewed in another quarter.

This mischief was evidenced by the cough, pain in the side, &c., and by subsequent events.

This symptomatic mania, although not of very frequent occurrence as a puerperal complication, yet does sometimes happen. Drs. Hardy and M'Clintock mention some cases, viz., Case XXII., page 62, in which fatal erysipelas, after labour, was ushered in by mania.

Case XXVI., page 64, in which mania ushered in an attack of metritis.

They also mention another case in which mania completely masked the existence of fatal puerperal peritonitis.—Page 71:—

"There is a fact of much practical interest connected with our present subject, which we may here allude to, namely: that abdominal inflammation sometimes alternates with the alienation of reason, and this at a period after delivery when a patient is usually considered free from the liability to such attacks. A remarkable instance of this was related to us by Dr. Johnson. A patient some days after delivery became maniacal, and in this state continued for a week, when she regained the possession of her intellect, but to this immediately succeeded violent peritonitis, which carried her off. A nearly similar occurrence took place in another instance, whose history we have given at length under the head of Convulsions, Case No. 8. In Case XXVI. of the present chapter it may be observed that, after the patient was attacked with mania, the symptoms of uterine inflammation almost entirely disappeared, but upon the return to consciousness they again became apparent. We lately saw a fatal case of puerperal mania, of the low, melancholic form, with rapid pulse. On examining this woman after death, there was found most extensive peritonitis, with copious lymphy exudation, although during life she had not exhibited a single symptom to lead to a suspicion of the existence of abdominal inflammation. This remarkable case was also seen by Dr. Johnson and Dr. Denham."

Drs. Sinclair and Johnston mention a fatal case in which it preceded, by some hours, fatal coma, where a cerebral abscess was found on autopsy. —Page 63. Also a case in which it ushered in fatal double pneumonia.

Dr. Tyler Smith also speaks of it as occasionally masking uterine or peritoneal inflammation.

Burns, in his work on midwifery, alludes to this in speaking of the origin of mania. He says, in some instances the delirium is connected with the state of the uterus, particularly of its veins, which are inflamed. There is fever, accompanied by delirium, which is the prominent symptom, so that the primary cause is overlooked till the belly becomes tympanitic; and presently, after this, the patient falls into stupor. At the first we may ascertain that there is more or less tenderness on pressing on the hypogastrium.

So also Montgomery mentions a case in which metritis coexisted with this form of mental derangement. And in the works of authors allusion is made to some instances; but in most of them the uterus or its appendages were in a state of inflammation; however, in this case, at the time that violent mania exhibited itself, the uterine symptoms had disappeared, and there was no hardness, nor enlargement, nor pain; nor was there subsequently any secondary deposit in or near the uterine region; in fact the mania showed itself first at the time that the phlebitis was beginning—if we may look upon phlebitis as the cause—to produce the changes in the pulmonary structures which afterwards manifested themselves in so peculiar a manner. If then it be presumed that phlebitis was the cause, as soon as the pulmonary tissue was selected for the further development of the puerperal poison, we may suppose that either from the effect of the opiates exhibited, or from causes into which we could not see, and over which we had no control, the maniacal symptoms disappeared, as from this moment she was perfectly free from any.

In the majority of cases of puerperal mania there is generally no physical cause that we can discover, but the disease appears to be connected with, or to depend upon, the irritation produced either by exhaustive labour, the attempt at lactation (hence it has been often called "mania lactea,"), of which I saw a very remarkable example when assistant in the hospital, which I well remember; in this case it followed secondary hemorrhage, of a most aggravated character, after labour; but the woman recovered from it, and she, indeed, has since borne children and never had any return of it. Or it may depend upon some peculiar idiosyncrasy or organization, and in some instances upon hereditary tendency or taint. Thus, Gooch says, "of the cases which I have seen a large proportion have occurred in patients in whose families disordered mind had already appeared"; and this remark of Gooch's is confirmed by the experience of many other observers.

Now although this is a mere surmise or presumption as to the manner in which, in this particular case, this phenomenon was produced, yet there are many circumstances to warrant us in, at least, not discarding it as unworthy of credence; it is no more wonderful than the effects produced upon the blood in the first instance, and then upon the nervous structures by other poisons.

If this view be correct then we are furnished with another explanation as to the cause of this curious complication or sequence of parturition in some cases, and it may be of use in forming an opinion as to the probable termination of it. We know that in the majority of cases in which puerperal mania occurs the patients remain for a considerable time before the integrity of the mental faculties is restored, whereas when there is merely a temporary delusion, and where it depends upon some dyscrasia, it may pass away soon, although the cause producing it may be of sufficient severity to destroy life, either rapidly, as in the worst forms of puerperal fever, or slowly, by the formation of abscesses in the several cavities or articulations.

The next point in this case to which I would take the liberty of directing the attention of the Society is the occurrence of a collection of matter in the pulmonary textures, and the gangrene, which must necessarily have taken place in the structure of the lung in order to impart the odour so characteristic of this disease; those two lesions of the lung are in themselves of very rare occurrence, as an effect of ordinary inflammation of the lung, but I am not aware of a single instance on record in this country of a case of even ordinary purulent deposit in the lung dependent upon phlebitis occurring after labour, much less one in which this was accompanied by sphacelus of the lung itself, although I need scarcely say that the history of puerperal diseases is most extensive, and that almost every phase of the affections comprised under the head of "puerperal" has been most minutely described.

In this case the pulmonary symptoms commenced with stitch or pain in the side, short dry cough, and it more resembled a case of pleuritis than one of pneumonia, but at no period was there evidence of pleural effusion, although there scarcely can be a doubt that the pleura was very much engaged; nor was there evidence of pneumonia in its first or second stages, either by physical or rational signs. It is possible that the matter expectorated in such quantities may have been secreted in an interlobar cyst, but it is perfectly certain that there was no evidence, at any time, of effusion between the costal and pulmonary pleura, or of communication between the pleura and bronchiæ, giving rise to the phenomena of pneumothorax.

My friend, Dr. W. Moore, has lately contributed a most valuable and instructive paper to the association, in which he has detailed the history of a very remarkable case of pleural fetid effusion occurring in a constitution broken down; and in this case the symptoms of effusion were very distinct, there being lateral enlargement, extensive dulness, absence of vocal fremitus, and respiration, and cardiac displacement, and the expectoration having a most fetid character, and in which those signs gradually disappeared on the ejection of the fluid secreted by the pleura. In this case there was no evidence of a communication between the pleura and the lung, and Dr. Moore accounts for the removal of the fluid by the explanation of transudation.

Any gentleman who has not had the advantage of hearing Dr. Moore's paper, I would refer to its published account in the 78th No., May, 1865, of the *Dublin Quarterly Journal.* Dr. Moore has given a very clear and able *résumé* of the subject, which has added to the diagnosis of pulmonary and pleural affections of a gangrenous nature.

In this case which I have read, there was, as I have said, no evidence of pleural effusion of either a diffused or circumscribed character; and I state this not having relied upon my own unaided opinion, but it being also the opinion of Dr. Stokes, who saw her on two occasions along with me, and most minutely explored every region of the chest upon both occasions of his visits, and coincided with the view which I entertained as to the nature of the affections, viz., that it was a collection of fetid or gangrenous matter occurring in some part of the lung itself. I need scarcely say to the members of this association that any opinion emanating from such a distinguished authority is entitled to the gravest consideration.

In his work upon Diseases of the Chest Dr. Stokes has detailed four cases of this affection succeeding pneumonia, and in all of them there were signs of a cavity, and the diagnosis was verified by autopsies. Dr. Stokes says:—"I have not found any peculiar physical signs in the gangrenous abscess of the lung. I believe that the only pathognomonic symptom is the extraordinary and disgusting odour of the breath and expectoration, making the patient loathsome to himself and all around him; the stench, however, is not constant, for during the progress of a case it may disappear more than once; in some cases the expectoration is fetid, while the breath is free from odour, and it will be often necessary that the patient be made to cough in order to produce the stench."

That phlegmonous pulmonary abscess is very rare may be believed when Lænnec stated that he had only met with six cases, and the same may be said of the experience of other physicians. Thus, Aitkin, Watson (except in cases where it occurs in connexion with phlebitis) and Walsh, all unite in expressing the opinion that pulmonary abscess is extremely rare, at least in these countries (although Rokitansky states that it is by no means unfrequent in Vienna); but the coexistence of a purulent collection, with gangrenous walls surrounding it, as it may fairly be presumed was the condition in the case which I have related, is an event still more rare.

Of the phlebitic origin of the case I think we can scarcely have a doubt, and that the phlebitis selected the lung in preference to other organs is not to be wondered at; however, I have never seen this before to such an extent. All accoucheurs are familiar with cases (in severe puerperal epidemics) where symptoms of pleuritis and bronchitis manifest themselves at a very early period of the affection; and I could relate many instances which I have witnessed in hospital of persons who were carried off rapidly by pulmonary congestion and bronchial effusion; at least such were the signs during life, and the appearances after death justified this opinion.

In some of these cases metritis, or metro-peritonitis, preceded or followed by rigors, ushered in this attack, and in others this thoracic complication appeared to set in very suddenly, without much premonitory symptoms, and very quickly carried off the patient; it is not at all impossible that in those cases phlebitis may have been the cause of the rapid termination. It much more frequently happens, however, that the phlebitis manifests itself by deposits in the different articulations, and the elbow, the knee, or ankle joints are attacked by arthritis, which generally terminates by the formation of purulent deposits. Nay, even it attacks the structures of the eye; and I remember very well seeing a case in which a purulent deposit existed in the anterior chamber of the left eye, in connexion with puerperal arthritis of the left knee. This is a very rare place for the disease to exhibit itself, and it occurred in the case of a patient whom I was summoned to see, in consultation, a few years since, and who afterwards fell a a victim to this puerperal arthritis. I have never seen a similar case in hospital practice, although the other form of arthritis was present in some of the cases which I have witnessed.—*May* 30, 1866.

Notes of a Case of Recovery from Traumatic (?) Tetanus. By S. M. M'Swiney, M.D., Physician to Jervis-street Hospital.

On the 5th of February, 1866, a lady called at my house to consult me about her son, E. G., aged ten years. She did not see me, however, as I was professionally occupied out of town during that day, and did not return until a late hour—too late to comply with the request made by the lady, in a message left for me, that I would visit her that evening. I received an account that the boy was seriously and strangely ill, and I made it a point to visit him at an early hour next morning.

His appearance, as I entered the room in which he was placed was very striking and remarkable, and served to reveal but too plainly the nature of his illness. His back was turned towards me, and he was endeavouring to stand, supported by the nurse, against whom he was leaning with both his forearms. His whole frame was fixed rigidly, as if he were petrified; his legs were wide apart; his knees bent; his back greatly curved forward; his head very much bent backwards, at the same time that it was drawn nearly down upon the left shoulder. When I changed my position and stood in front of him, the appearance of his face was extremely characteristic. It was so much altered from its normal state that, although knowing him very well, I could scarcely recognize any resemblance to his former self, His face was very pallid and damp with perspiration; his forehead was corrugated into many vertical and transverse wrinkles; his eyebrows were elevated, and at the same time drawn in towards the nose, which organ had a *pinched* appearance, whilst its alæ were dilating and contracting in unison with the respiratory movements, which were hurried and catching. His mouth was contracted and *pursed* in, its angles drawn *in* also; a quantity of white, frothy saliva was adhering to the lips and trickling down the chin. But I think the attention of an observer would be chiefly arrested by the appearance of his eyes—mine certainly was—which had seemingly become smaller, were fixed upon one in a furtive, rat-like manner, and afforded a typical example of what the late Mr. Colles, in his description of the "tetanic face," was in the habit, I believe, of calling "the peering eyes of tetanus." I felt the muscles of the legs, thighs, abdomen, and neck; they were, most of them, firmly contracted and almost as hard as stone,

The *sterno-cleido-mastoids* were very tense; the *right* one, in particular, was stiffened and bellied out to a most remarkable degree. The muscles about the cheeks and mouth, too, were rigid, and—whilst there was not absolute *trismus*—these muscles, by their contraction, prevented the teeth from being separated to a greater extent than from *one quarter* to *half* an inch. Through the slightly separated teeth the tongue could be seen much swelled and thickly coated. Two or three ulcerated spots could be seen on it, where it had been wounded by the teeth. The boy swallowed with great difficulty, and very unwillingly, each attempt at deglutition generally causing a violent paroxysm of convulsions. And this brings me to speak of the exacerbations of the disease. They came on at somewhat irregular intervals, often from every *ten* to every *twenty* minutes; sometimes the intervening period would be much longer than this, and occasionally even shorter.

Whether awake or asleep the advent of a paroxysm was announced by a fretful, complaining cry, and an urgently-expressed desire to be held up. The back was greatly curved; there was, in fact, complete *opisthotonos.*

He seemed to suffer severe pain during the time the spasm lasted, a period usually of 12 or 15 seconds, after which he returned to his previous state of abated or mitigated suffering. He had a troublesome, short, hissing cough, caused, apparently, by the rapid accumulation of a viscid mucus about the pharynx, which he wished to get rid of, and which slavered his teeth and lips. His voice was reduced to almost a whisper, and even an attempt to *speak* seemed to cause him considerable distress. His pulse was very fast, usually 120.

The *history* I received about this boy's illness was as follows:—He had been noticed to be not quite well *six* days before the time of my visit. He was pale, slow, and, as it was thought, stupid, in his manner. His tutor complained that he would not learn his lessons; he was even chided for playing antics and making grimaces; he walked in an odd and somewhat constrained manner, as if he were stiff from some cause or other. His appetite was failing, and at night he was restless and feverish. But no particular attention was paid to him until about *three* days before I saw him, when his mother thought he had *rheumatism*, and gave him some mild medicine. From that time his symptoms increased in severity until they arrived at the height already described as their state when I first visited him. There was no recent cut or abrasion on any part of his body, nor was there any history pointing to such. Two occurrences, however, either, or both of which, had, I think, exercised an important influence in the production of this attack, had taken place about a fortnight before he was seized with his illness; *one* was that he had slipped when going down the steps leading from the hall door to the street, had fallen back heavily, and was pained and stunned for a short time. The *other* occurrence took place about the same time as the fall, and was this:—In the course of some school game, or play, he had carried a boy, older and much weightier than himself, on his back for some time. He was obliged to desist, however, from sheer fatigue and inability to continue, and he was noticed to be pale and exhausted after this exertion, during which, I have no doubt, his spinal cord received some hurt. I had no difficulty, as may be easily supposed, in diagnosing the nature of this boy's illness, and I concluded that it was of the *traumatic* variety. There was, to be sure, no wound with a solution of continuity, but such is not requisite to constitute *tetanus* "traumatic." A blow, bruise, or violent concussion may, it is known, produce this form of *tetanus* without causing a division of any of the tissues, and the great severity of the symptoms and the rarity of the idiopathic form in these countries, formed considerable elements in addition to my estimate of the influence exercised by the above-named occurrences in bringing me to this conclusion. I had no reason to suspect the existence of intestinal worms—by far the most frequent cause of the *idiopathic* variety—nor could I surmise any other cause of reflex irritation. Still, as a preliminary proceeding which might help to determine this question more certainly, I at once threw up a strong turpentine and oil enema, and gave a smart calomel and rhubarb purge. The bowels were shortly moved, and acted well some *four* or *five* times, but no worms were expelled. I explained the gravity of the case to the parents, ascribing the attack to injury of the spinal cord, inflicted upon either of the before-mentioned occurrences, and I advised a consultation to be held. Dr. Banon was associated with me, and had no hesitation in confirming my diagnosis. We held out no—or at least but very faint—

hopes of recovery, and we settled the plan of treatment to be adopted. I will not weary members by describing minutely the progress of this case day by day. It will be enough to mention that for the first *three* days he appeared frequently in danger of immediate death. On the *third* day he vomited during an attack of unusual severity, and was thought to be about to die. The *masseters* and *buccinators* were rigid on this day, and actual closure of the teeth seemed imminent. He rallied, however, and on the *sixth* day the severity of the symptoms was moderated. On the *eighth* day it was noticed that he was comparatively free from *severe* spasms during the day, but still suffered very much during the night. On the *twelfth* day my note is:—"Much improved to-day; was not so bad during the night, and slept tolerably well. Muscles less hard; is able to open his mouth wider and swallows better; his countenance is more natural; his recovery may now be reasonably expected."

He was so well on the *fifteenth* day I did not consider it necessary to visit him on the next day, and on the *nineteenth* day, although still weak and tottering, I was able to pronounce him to be, in all important particulars, well.

With the reading of my notes of the history, symptoms, and termination of this case of acute tetanus, I have well nigh exhausted what I had to say in the communication which I have the honour to make to the Association. But to render the description of the case more complete, some mention of the nature of the *treatment* had recourse to must now be made. Dr. Banon and I agreed, in consultation, not to adopt any so-called "heroic" method of treatment, but rather in our management of the case to be guided by the principles of common sense, experience, and the known action of remedies on the living, human body.

Starting with the proposition that the disease was one of a morbidly excitable condition of the spinal cord, arising from some abnormal irritation, and producing convulsive spasms, which tended to destroy life, either by *apnea* (which might occur at any moment) or by, from their violence, wearing out speedily the strength of the patient, we decided upon a treatment which should have a two-fold object, viz., *first*, to allay or mitigate the violence of the convulsions by the application of counter-stimulation along the course of the spinal column, and the administration of some of those substances known in medicine as "anti-spasmodics;" and, *secondly*, to sustain the energy of the muscular system by the frequent and persevering exhibition of invigorating and nutritious substances. We had scarcely the faintest expectation of being successful, but we considered that a treatment deduced from these views afforded the only possible chance of a cure. Strong animal broths were directed to be given, as well as he could be persuaded to swallow them, at frequent and regular intervals. Beaten-up eggs were prescribed for him. He was ordered to have from *six* to *twelve* ounces of wine in the *twenty-four* hours, in half-ounce doses. And as his power of deglutition was seriously interfered with, we directed that *four* ounces of the strongest beef-tea, with from *two* to *five* grains of sulphate of quinia, should be regularly thrown up the rectum every *six* hours, and every effort made to retain it there. In addition, *milk*, in any quantity he could be got to take it, was allowed.

The drugs employed were—*chloroform*, *tinctures of belladonna*, *Indian hemp*, *opium*, *hyosciamus*, and the preparation of ether, known as "*Hoffman's Anodyne Liquor*."

A draught, consisting of a proportion of one or more of these preparations (just as, at the time, appeared judicious) was given, at intervals of about *six* hours night and day. The effect was anxiously watched and studied; and the dose was fixed, as nearly as could be, at the point where seemingly it could exercise its sedative or controlling effect on the convulsions. And as observation would appear to warrant, sometimes one, sometimes another, of these preparations would be omitted or substituted, as the case might be.

Vesicating collodion was applied along the spine, from the neck to the sacrum. I think a point of considerable importance in this treatment was, that the nourishment and remedies were directed to be given, in suitable quantities, at comparatively short and regular intervals, night and day. I strongly impressed the value of this course upon those in attendance upon the boy; and I must say that I ascribe the successful result, in a great measure, to the fact that the treatment was scrupulously and perseveringly carried out to the letter. The boy's mother, and an excellent nurse, never left him night or day, and gave draughts, nourishment, and enemata with the utmost regularity and exactness. I may, perhaps, be allowed to mention, that I myself often stayed a long time with him, introducing slowly and with great difficulty, through the almost locked teeth, a quantity of one or another of the nutritious or medicinal substances named above; and, taking a deep interest in the case, I made a point of giving him, twice every day, for some time, an enema of strong beef-tea, with four or five grains of *quinia* in it. Success ultimately waited upon this combined plan of treatment; his strength was well sustained by *the food*, whilst the dreadful spasms were somewhat held in check by the *narcotics*, until, finally, their energy was altogether worn out and overcome. I do not propose to enter into any speculation as to the essential nature of tetanus, an obscurity—which remains yet to be dispelled—admittedly surrounds its pathology. I content myself, on this occasion, with presenting a succinct report of the facts, as far as I observed them, of the case I have just detailed.

On Insanity and Criminal Responsibility; a Commentary on the Autobiography of a Criminal Lunatic.

By THOMAS MORE MADDEN, M.D.; M.R.I.A.; Licentiate of the King and Queen's College of Physicians in Ireland; Member of the Royal College of Surgeons of England; Licentiate of the Faculty of Physicians and Surgeons of Glasgow; Demonstrator of Anatomy, Carmichael School of Medicine.

A REMARKABLE case of insanity, leading to a double attempt at murder and suicide, which came under my notice in May, 1865, led me to devote consideration to the medico-legal relations of insanity in reference to criminal responsibility. The result of this inquiry has been to show me in how unsatisfactory a state our criminal jurisprudence is on these points; and I now call attention to this case for the purpose of pointing out the defects of the present system, and of offering some suggestions for its improvement.

On the 22nd of May, 1865, J. E., aged eighteen, an inferior employé in a public office, who had only, within a period of six or eight weeks, recovered from fever, was observed by a medical gentleman in the office to present a wild and restless appearance, and was recommended to go home and remain there for some days; accordingly, he returned to his mother's house, at Drumcondra, where nothing peculiar in the lad's conduct was observed by his family. At the expiration of some days he returned to his employment, stating he was quite well. The gentleman above referred to again observed the same expression he had before noticed, and called the attention of the senior clerk of the office to it desiring that the boy should be allowed to leave the office earlier than usual, or for some days more, if he wished, to remain at home. He left that day at the usual hour; conducted himself quietly during the evening; but at night, when all the members of the family were asleep, he arose and made his way to his mother's room, on entering which, he flew at her—then in bed—and attempted to kill her with a hatchet, which it was afterwards ascertained had been concealed by him several days previously; but her cries, fortunately, brought timely assistance, and she escaped with some slight injuries. Before the lad was seized, however, he inflicted a slight wound upon himself, in the right breast, with a clasp knife; threw himself on the ground, roaring vehemently, and endeavoured to dash his head against the wall. Having been secured, he was carried to his bed, when, after some hours, however, feigning sleep, he took advantage of the inattention of those who watched him, and, early next morning, made his escape from the house and flung himself into the River Tolka, near his place of abode, in Clontarf; he was pulled out, with some difficulty, by a policeman.

Next day he was brought before a police magistrate, charged with the attempt at murder and suicide, and was committed to prison. By the exertions of Dr. R. R. Madden, however, he was, ultimately, sent to the Richmond Lunatic Asylum, placed under the able care of Dr. Lalor; he was discharged, as cured, in November last, and is now earning his bread comfortably and creditably in another public office in this city.

This young man was a pale, cachectic lad, of emaciated habit and leucophlegmatic temperament, badly brought up, ill-educated; his only reading being the cheap *sensational* tales and novels published in the London penny serials, to the perusal of which, notwithstanding various remonstrances and admonitions of his superiors, he devoted every spare moment.

After this outbreak of insanity, which I have described, a quantity of papers and fragments of papers, in his hand-writing, were found in his desk, written in the sensational-novel style he delighted in. Amongst these manuscripts was one document, entitled, "Autobiography of J. E.," written immediately previous to his attempted matricide; and I am now induced to publish a few extracts from this paper as a curiosity of psychological literature. These fragments furnish the best comment I have ever seen on the effects to be apprehended from the prevalent sensational cheap literature of the present day.

"—*Autobiography of Joseph E.*—Joseph E. was born on the 20th of March, 1846. He displayed in his infancy a quick, volatile, proud disposition, and, although this was seen by his mother, she never took any pains to eradicate it, and let him go on without doing anything towards removing this grievous evil; but she was a poor struggling woman, and had her husband lying ill for months and months on his back, and she had no means of support only merely what she would earn by her own industry. There was never in this world a more industrious woman in the world, though she never took any pains to inculcate this virtue into Joe, for she thought as she acquired this industry naturally, as she thought herself, she imagined Joe could not be otherwise; so, thus, the best boy in the world was ruined by being let go and take his own head and habits in all things, for his mother thought all was over when she sent him to school.

"You never, I suppose, thought it necessary to know whether he minded his prayers or not, or religious duties or not; oh, 'twas terrible! oh, horrible! horrible! Oh, how could God stand it and let the child live and go with such wings to the devil? Oh! never, never, will she forgive herself for this. But to return, as well as my poor head can let me, unfortunately as it proved he was sent to a small National School when six years of age, and his disposition may be proved by an instance which I may lay before the reader, if ever this finds one. . . . Oh, reader! never take pleasure in reading those things; never soil your hands with them, but of dire necessity as a warning, and take care you take it in that light. Oh, my God! my God! never,

never let such things as low novels, romances, &c., stay a moment before your eyes. Oh! consign them to the flames at once, and never let them stay in children's hands for a moment, for if you do, they are drinking in destruction Oh, hear me, ye mothers! mind the principal affair of your children's welfare, viz.: the affair of their salvation, and never let those things or any such like enter your child's hands; if thou hast nature in thee stand it not. Oh horrible things! *oh*, *Reynolds* and Company what a horrible mess your are making of young minds and young hearts by bringing them to ruin by your heathenish publications. Oh, you are a set of sheep in wolf's clothing. But to return to the subject:—Joe's mind was capable of any impression that might be affixed on it. He might have been good at anything if his mind got any good impressions at that time, for a better disposed child never lived; yet, worst of mothers, look at what your darling boy came to by your heathenish way, and you now may curse the day you married your last husband, for since then you never attended to religious duties, and you may thank that accursed marriage for all the evils that it has brought on all and your darling son. Oh, mother of mothers, have not I reason to curse you, if I would do it; but may God in His mercy and pity have mercy and pity on your poor unfortunate soul; oh, I pray that he may; oh, the Lord hear my prayer; oh God of glory have mercy on you; oh may the angels bear you away, my mother; oh let me suffer in another state till judgment day, and stay there for ever until the judgment day; oh mother, picture the delight of us two poor mortals to be in that transitory state for years until all, all our sins are purged away; oh mother, picture then our delight on being admitted into heaven among God and his saints and faithful, when we will get the lowest, lowest, lowest place among them, please the great God of all glory, of all glory, of all mercy, of all infinite goodness; oh mother, mother, darling mother, can we get into such a place, think you, can we, oh mother; you have received such injuries, such crosses, oh mother forgive all I have said to you; oh forgive mother and forget also, mother, God will forgive, oh God will forgive us; oh we were mad—cracked—oh, we were mad; oh mother, the light of hope shines on my path, and I am here writing this in great hope, mother darling, of being with you in heaven. Oh, may the Lord my God look over them; oh 'twill be little matter of me when my body is rotting in the earth, of my body which I was sent mad by you, and everyone, being so proud of it; oh let me never look on the face of myself, my diabolical, unfortunate self again; oh, may the God of all glory, look on the virtues, oh but where will he find them; oh none—none—none—none—none—none—none—none—none—none—none—none—none. Till judgment day I might cry none; oh, may heaven deign to look on you and me with pity and mercy and clemency. Oh, the devil tempted the whole of us to sin; oh mother, still you did not fall into great crimes, for witness your horror of hearing Mary the fishwoman swear false; oh mother, I am greatly afraid I will not find the same favour of you; oh heaven grant it; oh, if you be sent to heaven and I get my choice of either you or I to go to heaven, one of us and not the two, oh, I will willingly, mother, let you go, and I will e'en take place with the d———d. Oh mother hear me and heed me, I pray you; oh, mother, prepare for death, *neither of us can live long;* oh mother, 'twill be an imposition to stay for two weeks here, and then get the month's money after getting one month's pay in advance already. Oh mother, why, oh why did you not take great care that I would be properly minded and taken care of? Oh horrible, oh horrible, most horrible; if thou hast nature in thee stand it not; oh mother, mother, mother! goodbye—goodbye—goodbye—goodbye—goodbye. Oh mother, what might have been—oh, unfortunate fool of a mother, oh why did you not come to me long ago, and never forsake the true path; oh mother, mother, goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—goodbye—gooodbye. Oh, mother, my dear fond—alas, too fond affectionate—alas, fatally so; oh mother, mother, mother—unfortunate mother; oh mother, mother, I pity you—I pity you—I pity you—I pity you—I pity—oh mother, you did not pity me; oh mother—no—no—no—no—no! Oh mother, you were greatly at fault. Oh, reader, if this finds one, take warning; oh, for Jesus sake, take warning; oh, for heaven's sake take head; my God, my God, why hast thou suffered this? oh why not put me on my guard? oh, why not question me?"

In the same desk as the foregoing insane autobiography there were also found several other documents which were equally characteristic of the writer's insanity. Amongst these were the following fragments of unconnected observations not of the same date, probably, as the preceding rhapsodies:—

"You saw in me the germs of the worst passions that could ever be sown in any mortal. Oh, poor unfortunate mother! oh! you are reaping the harvest you have sown; you are mourning for your cupidity; oh, you are looking towards the grave of the son you have ruined with horror, for he chiefly employs his time in cursing the day he was born; oh, poor deluded wretch! from the teaching and from the praise he got from the companions of his boyhood and youth, they puffed up the already too proud and headstrong spirit of the boy, and made him forget almost that there was any God in the heavens. Oh, poor boy! oh, unfortunate child! oh, wretched youth! oh, poor boy! who never tasted any of the true delights of this life, let alone any of the foretastes of the next. Oh, heavens! what a good disposition he possessed, and what a lively, hearty, enthusiastic child; of a strong and healthy frame, although his father was a poor, sickly, weak man.

"Oh! with what a quick hurried bound he leaped into school; no hesitation, no drawing back then; no, no, all straight; head up, and ready to look the world in the face. Oh! with a little care what fine stuff was there to be moulded to a good shape, but it was let run to rust, and now it is gone completely to ruin. Oh, poor unfortunate child! oh, infernal mother! oh, mother! who being blessed with a son never once in his infancy held up his childish hands in prayer to the great God of all glory. Oh, villain! worse than the most *diabolical*." . . . .

The handwriting of the preceding rhapsodies, though very legible, is peculiar. The words run closely into each other. There are no stops, no space left unwritten, no margin left unscribbled on the sides of the paper. The absence of margins and stops has been noticed in other cases of documents written by the insane, and has been commented upon; among others by Olivier d'Anges, and Bayard, in the *Annales d'Hygiène*, Vol. XIX., p. 490.

In this case we find a boy originally of a low order of intellect, of limited capacity, vain, frivolous, and of weak resolution, whose education and moral discipline evidently appear to have been neglected, and whose only reading was the lowest class of *sensational* literature, full of thrilling tales of crime and mystery. This kind of reading engaged his entire leisure, and evidently filled his imagination; so that like Don Quixote he surrounded himself with a world of fiction, which shaped his subsequent mania. Thus the autobiography, the attempted murder, and abortive suicide, all bear the impress of this mental dram-drinking furnished to the poor in the London penny sensational periodicals, and to the rich in more pretentious sensation novels and magazines.

The ill effects of the long continued and exclusive perusal of such literature, especially on young minds, are similar to those described by Fabius:—

"Educatioaltera natura; alterat animos et voluntatem; atque utinam (inquit) liberorum nostrorum non ipsi perderemus, quum infantiam statim deliciis salvimus; mollior ista educatio, quam indulgentian vocamus, nervos omnes, et mentis et corporis, frangit: fit ex his consuetudo, inde natura." —Lib. I., cap. 3.

I have heard it said that the influence on the particular forms of crime which have been ascribed to novels is as imaginary as are the scenes depicted in those works themselves. But that such is not the case we have abundant proof. Madame de Stael assures us that the *Sorrows of Werter* occasioned a vast increase in the number of suicides in Germany at the time of its publication. Anyone who has had occasion to turn over the police reports of the London newspapers of some forty years ago, will find this influence of literature shown in the number of foolish youths charged each morning with emulating the exploits of the heroes of Mr. Pierce Egan's then celebrated *Life in London.* Some years later Mr. Ainsworth's *Jack Sheppard* seems to have excited a highwayman epidemic among the lads in many a country town. And we have reason to suppose that a similar influence is still exercised by the penny serials, such as *The Boy Pirate*, *The Young Highwayman*, and the cheap and coarse stimulating literature of the penny weekly journals, to which the individual on whose case I am commenting, abandoned his feeble mind.

This case is a good example of the *manie raisonnante* of Pinel supervening on fever. There seems to have been no hallucination, but, simply, a perverted affection which led the boy to suppose that, as his mother had, by neglect of her duties, religious and maternal, imperilled her salvation, it was his duty to save her from eternal retribution by depriving her of time and opportunity for incurring further guilt by killing her, and then committing suicide with the view of joining her in the next world. This *manie raisonnante* has its analogies with Bardolph's reasoning in his lamentation for his dead master :—" Would I were with him wheresome'er he is—either in heaven or in hell! "

Had this boy succeeded in his attempt on his mother's life he would have been tried, as a matter of course, for murder; and if the plea of insanity were set up we should, in all probability, have had abundant sarcasms about " the pseudo-sentimentality of the mad doctors," and what one journal, commenting on a trial, not long since, elegantly designated " the moral insanity dodge for cheating the gallows." We would have found medical men, who had seen the patient, testifying their belief in the perfect sanity and consequent criminal responsibility of the writer of the preceding diary. Very possibly, too, he might have been tried by a judge who disbelieves in partial, or so-called " moral," insanity, and a jury who believe, of course, whatever they are told by the judge; and the wholesome and salutary spectacle might have been exhibited of a human being publicly put to death because suffering from the most dire disease that can afflict human nature.

The term " moral insanity," which many might apply to the foregoing case, is often and, I think, justly objected to; but the idea intended to be conveyed by it, of insanity marked by hallucination of the moral faculties or affections, without any *obvious* derangement of the intellectual powers, unquestionably applies to many cases. Every one conversant with the forms of insanity must have met cases in which a sudden perversion of feeling sets in and hastily changes the natural disposition and character of individuals whose minds still preserve the semblance of reason, while their moral conduct or natural affections become so unaccountably changed. The phrase itself, " moral insanity," seems to me a most unhappy one, however. For, although cases do sometimes occur, as within the last few weeks we have had a notable instance, in a recent trial in Dublin, in which disorder of the moral faculties alone is apparent, it does not follow that disease of other mental faculties does not co-exist with this moral disorder, though not so evident. Moreover, the very serious objection has been urged that the idea of "moral insanity," if widely extended, would lead to the fearful doctrine, that crime is generally the result of an involuntary and irresistible mental malady by which all freedom of volition and of action are destroyed, and, that crime and madness being synonymous, men are, consequently, not responsible for their evil actions.

Instead of the numerous terms used to describe the various types and forms of insanity—and which seems to me, although, doubtless, of value to the psychological physician, calculated rather to embarrass and perplex than to aid the medical witness in courts of law—I would venture to suggest that, for medico-legal purposes, unsoundness of mind, not including mental deficiency or idiocy, should be divided into the two classes only, of general and partial insanity; the latter being the only one in which medical evidence is needed in cases of crime ascribed to insanity.

A madman is, it may be presumed, one in whom the faculties, or any one of them, which should regulate and point out his relations and behaviour towards God, his neighbour, or himself, are either lost or impaired by disease.

Obviously, such a person cannot be considered as either morally or legally responsible for his actions. For to be responsible for an act it is essential that the person committing it should possess liberty of will as well as of action, which a lunatic does not enjoy, or he would be none.

But besides the state of mind in which a man is responsible for his acts, or sanity, and that condition in which he is not accountable for them, or insanity—there is a third condition of mind in no way provided for by our law, and which seems not sufficiently recognized even by the medical profession. I allude to what Baron Von Feuchtersleben terms, "a state of half freedom." [a] That is a state of transition between the healthy and unsound mind, either preceding or following insanity. In this state the patient is only partially able to exercise self-control, and therefore is but partially responsible for his actions.

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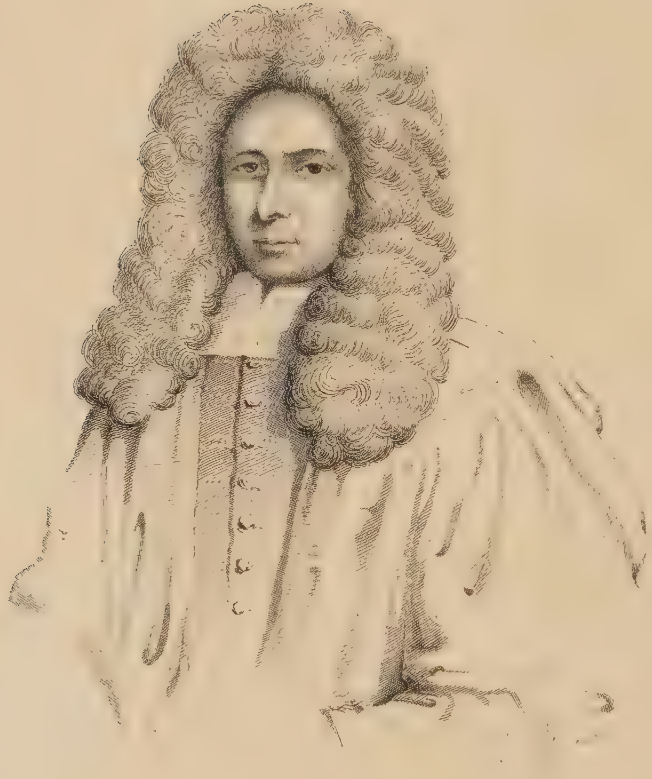
[a] This peculiar condition of mind should be recognized by law in this country, as it is in France, where on a jury bringing in a verdict of "plus innocent que conpable," the Advocat-Général may order an investigation into the state of mind of the prisoner, and award a punishment in proportion to the real guilt of the accused.

(*To be continued.*)



Pat: Dun President

Engraved by W. H. Lizars, from the original painting by Sir Godfrey Kneller
for the Dublin Quarterly Journal of Medical Science.

Memoir of Sir Patrick Dun (Knt.), M.D., sometime President of the King and Queen's College of Physicians in Ireland; including his Will, his Deed for Constituting a Professor of Physic; and Several Important Records concerning the Profession of Physic in Ireland, never before published. By T. W. Belcher, M.D., Dublin; B.M. and M.A. Oxon. and Dublin; Fellow and Censor of the King and Queen's College of Physicians, &c.

INTRODUCTION.

During the last year I published a memoir of Dr. Stearne, Founder and First President of the Irish College of Physicians; this was so favourably received by the learned body to which I have the honour to belong, that, at their request, it was re-printed, in a separate form, from the *Dublin Quarterly Journal;*[a] and was considered by some friends, in whose judgment I place confidence, to give a fair idea of the state of the profession of physic in Ireland during the latter half of the seventeenth century, as well as a true account of the ancient relation of the College of Physicians to its Alma Mater, Trinity College, Dublin.

The present memoir will, in effect, continue the history of the College of Physicians from the death of Dr. Stearne, in 1669, to our own day; and thus, beside placing on record all that I have been able to collect about a remarkable man whose name is familiar to us in connexion with his medical bequests, it will, I trust, in some degree serve the important interests of medical education in Ireland. Beyond a short sketch of Dun, which appeared in the *Dublin Quarterly Journal*, in 1846, from the pen, I believe, of Mr. (now Sir William) Wilde, and a prior notice of him which the late Professor Osborne published in his *Annals of Sir Patrick Dun's Hospital*, in 1854, nothing has been hitherto done, so far as I have ascertained, to obtain and publish full and accurate information about a man whose memory well deserves to be cherished with respect by the citizens of Dublin, and by the medical profession in Ireland.

In the following memoir I have inserted all the material proper to such a work, which I could obtain after diligent and long-continued search. In it will be found several original and important public documents not hitherto printed, as well as private letters of Sir Patrick and Lady Dun, and other curious matters.

AUTHORITIES.

I may briefly note the chief authorities used or quoted in this memoir:—Mr. Wilde's *Memoir*, already quoted; Professor Osborne's *Annals, &c.;* Dr. A. Smith's *Early History of the College of Physicians in Ireland* (*Dub. Jour. Med. Sci.*, vol. xix.); Mr. Wilde's *Contributions to the History*

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[a] For May, 1865.

of Medicine in Ireland, Dublin, 1846; *Various Statutes of Parliament; Journals of the Irish Houses of Parliament;* Dr. W. D. Moore's *History of Pharmacy in Ireland* (*Dub. Quart. Jour.*, Aug., 1848); Journals, and other books and papers of the K. and Q. Coll. of Physicians, and pamphlets in the Library there; MS. petitions and minutes of committees among the Parliamentary papers in the Record Office, Dublin Castle; Barrett's MS., described in my memoir of Stearne, and kindly lent to me for this purpose by the Rev. Dr. Todd, S.F.T.C.D. Beside all these, I have particularly to acknowlege the kindness of Sir Bernard Burke, Ulster King of Arms, who not only allowed me to read the records of Civil Affairs in the minutes of the Irish Privy Council, and other documents kept in the Record Office; but who, himself, in various ways facilitated my work, and gave me much original information, which is duly acknowledged in the following pages. I have further to thank Dr. Lyons, one of the present Censors of the College of Physicians, who kindly placed at my disposal a collection of original MS. letters addressed to Archbishop King, which had come into his possession; some of these, written by Sir Patrick and Lady Dun, appear in this memoir. Further, I must thank Dr. Dyce, of Aberdeen, for the loan of a privately-printed memoir hereafter quoted, and for several letters and papers of value, which appear or are referred to by me; some of these he obtained from gentlemen to whom I also give my best thanks, viz.:—The Rev. William Barrack, Rector of the High School, Aberdeen; the Rev. Archdeacon Bisset, of Lissendrum, a collateral descendant of Dun; and John Stuart, Esq., Keeper of the Records in the General Register House, Edinburgh.

THE FAMILY NAME.

With reference to the spelling of the names I may observe that every possible variety seems to have prevailed. In the following remarks it will appear spelled as Dune, Dwne, Dun, Dunn; in fact there seemed to be no authorized spelling of the family-name; and it must be remembered that at this time (1642–1713) men altered all these things at pleasure, and with a frequency which we know nothing about now. In the *Dublin University Calendar*, for the present year, the editor kindly added a note of mine, under the head of "School of Physic," to show that Sir Patrick never spelled his name in any other way than as "Dun." He signed himself at various times as "Dun," "P. Dun," "Pat Dun," and "Pa. Dun;" but in no instance did he sign his surname as "Dunn."

DUN'S BIRTH AND FAMILY HISTORY.

The subject of the present memoir was born in Aberdeen, in January, 1642. His father, Charles Dun, litser (or dyer), was a burgess of Aberdeen, and Patrick was his second son by his second wife, Katherine

Burnet. This branch of the family of Dun had been then long settled in Aberdeen, and belonged to the ancient stock of Dun of Dun, or of that Ilk, near Montrose.[a] Charles Dun was one of the nephews of Dr. Patrick Dun, Principal of Marischal College, and the munificent endower of Aberdeen Grammar School, where his name is to this day held in great respect; and where his portrait (by Jamieson), presented by his representative, Archdeacon Bisset, may be seen.[b]

In a letter from the Rev. William Barrack, Rector of the school in question, to Dr. Dyce, of Aberdeen, dated 3rd February, 1866, the following passage occurs:—

> "There were certain Registers kept in the Town House which might have thrown some light on the subject, but these have all been removed to the Register House, Edinburgh; but I have no doubt Sir Patrick's name will be found in the Register, and the exact date of his birth will thus be ascertained. Dr. Patrick Dun, who bequeathed the lands of Ferryhill to the Grammar School, must have been his grand-uncle, for in the bequest he says, 'After my decease I nominate, constitute, appoynte, and ordayne the Provest, Baillies, and Councell of the said burgh of Aberdeen, for the time, with Maister Robert, Charles, and Patrick Dunnes, my brother sonnes, and their aires male of perfyte aige, they being known to be honest and conscientious, and not given to railing, to be Patrons and Conservators, *in perpetuum*, of this my mortification.' The will is dated 1631, August 3, so that Sir Patrick, born in 1642, must be a son of one of these three, the nephews mentioned above, and, therefore, grand-nephew of Dr. Patrick Dune, as he spells his name in the will. There are no records in the Grammar School, and none in Marischal College; but there is no doubt Sir Patrick first attended the one and then finished his studies in the other; after which he probably proceeded, like other learned Aberdonians of that day, to some continental university, to finish his medical education. Dr. Liddel studied at Heidelberg and Rostock, and was Professor at the Julian University, Helmstadt, where Dr. Patrick Dun studied."

Mr. Barrack then proceeds to say that the Duns of Tarty, the family locality of Dr. Patrick Dun, the grand-uncle of the subject of this memoir, have ceased to exist.

The records to which Mr. Barrack refers were examined, as appears by the following letter from Mr. Stuart, Keeper of the Records, General Register House, Edinburgh, to Dr. Dyce:—

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[a] "Of which family was the famous Duns Scotus."—Nisbet's Heraldry, 1722.

[b] Charles Dun (Sir Patrick's father), died in 1667.—Osborne's Annals of Sir P. Dun's Hospital. Dublin, 1844.

"GENERAL REGISTER HOUSE,
"EDINBURGH, 8*th Feb.*, 1866.

"DEAR SIR,—The Registers to which you refer are not in my charge, but my friend Mr. Patton, in whose department they are placed, has examined them for sixteen years, and the result is the enclosed extracts.

"I trust that they may be useful. I have looked into our Spalding Club books, but see no notices of Dun. In the Poll Book of 1696, in the parish of Logie, Buchan, I see the family of Tarty are enumerated, but I do not know their relationship to your man.

"I am, very truly yours,
"JOHN STUART.

"You will see that *Dr.* Patrick Dun was one of Patrick Dun's godfathers. "J. S."

The following is a copy of the extracts enclosed by Mr. Stuart; they are interesting as showing the way in which such matters were recorded in Scotland at that time, particularly as regards the spelling. It will also be noted that the Dun family belonged to the then Established Church of Scotland—the Episcopal.

"Anno 1638 yeares. Charles Dūne & Cathren Burnet, mariet the penūlt day of December."

"21 October, 1639. Charles Dwne and Cathreine Burnett, ane sone, his name Andrew. Bap. be Doctor James Sibbald, Doctor Williame Johnestoune, Mr. Robert Farq^{r}., bailzie Alexander Jaffray, Andro Burnett, and Alexander Ramsay, Godfatheris."

"31 October, 1640. Charles Dune and Kathreine Burnett, ane dochter namitt Kathrein. Bap. be Doctor Wm. Guild. Mr. Alexander Jaffray late Prowest, Doctor Robert Dwne, Daniel Aidie, Thomas Burnett, William Innes, and Alex^{r}. Burnett, Godfatheris."

"13 Januarie, 1642. Charles Dwne and Kathreine Burnett, ane sone namitt Patrick. Bap. be the said Mr. Androw; Doctor Patrick Dwne, Mr. Johne Osūall, Mr. Patrick Chalmer, John Jaffray, Wm. Cutbert, and Patrick Fork, Godfatheris."

"9 November, 1645. The said day Charles Dunne & Kathreine Burnett ane sonne named Hew. Baptised be Wm. Robertsone. Rober Tailyeour, &c., Godfatheris."

"13 December, 1649. Charles Dunne and Catherin Burnett, ane daughter Jeane. Mr. Alex. Irving, Minister, &c., Godfatheris."

(From Registers of City of Aberdeen, searched till 1654.)

Several interesting particulars respecting the family of Dun and their descendants, are recorded in a valuable privately printed book, of which

Dr. Dyce, of Aberdeen, kindly gave me the perusal.[a] In note G., page xii., will be found notices of the family of Anderson, of Bourtie, and of the family of Ross, of Arnage; and in note U., page xlii, some curious information is given respecting Principal Dun, and the family of Johnston—all closely connected with Sir Patrick.

In this book, among other curious matters, it is stated that Christian Mitchell, widow of Charles Dun, litser in Aberdeen (who had died in April, 1581), was burned in that city on the 9th March, 1597, "on various charges brought against her of sorcery and witchcraft—the most of which were, that by administering drinks Christian Mitchell had caused the death of her own son, 'Andro Dwn,' and her 'awin dochter in law—vmquhill Maray Johnstoun.'" It is not the least singular circumstance connected with that affair, that the unhappy woman confessed the truth of the accusation brought against her before the magistrates of Aberdeen, "as ane commoun witche and sorcerar, be oppin voce and commoun fame, sua reput and hauldin thir xxviii yeris bygane, be vsing of witchecraft and sorcerie, be the inspiratioun of the Devill."—"In signe quhairof, the Devill gaf the a nip on the bak of thy richt hand, for a mark that thow was ane of his numer." The writer then proceeds to state, that about the close of the sixteenth century the citizens of Aberdeen were possessed with a mania on the subject of witchcraft, and he refers to Vol. I. of the *Miscellany* of the Spalding Club (1841) for information respecting that epidemic; at the same time remarking that at pages 164, 165 of the volume in question will be found a copy of "the particular dittay and accusation, confessit be Christen Michell, relict of vmquhill Charlis Dwn, litser, burges of Abirdene, quhairvpon the said Christen is accusit as a notorious witche and sorcerar, in using the craft and tred thereof, be the inspiration of Sathan, thir many yeris by past." This unfortunate Christian Mitchell, or Dun, whose only crime, in all probability, was that she was old and ugly, was paternal grandmother to Principal Dun, and, therefore, a relation of Sir Patrick in the direct line.

HIS PROFESSIONAL CAREER, AND CONNEXION WITH THE COLLEGE OF PHYSICIANS.

I have searched in vain for any particulars of Sir Patrick's early career; and the first notice of him, so far as I know, occurs in a letter written from Dublin Castle by Sir John Hill, to Lord Forbes, then of Culloden, near Inverness, father of Duncan Forbes, who, by his wife Mary Innes, daughter of the Laird of Innes, in Morayshire, was, in his turn, father of the celebrated Duncan Forbes, Lord President of the Court of Session. Hill writes[a] (as quoted in the *Culloden Papers*, published at London in 1865, page 10), under date 14th February, 1676:—"Here is one Dr. Dun, an Aberdeensman, who is Physitian to the State, and to my Lord Lieut., desires to have his service remembered to your son, Duncan, with whom he had acquaintance in Paris."

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[a] A short Memoir of James Young, Merchant Burgess of Aberdeen, and Rachel Cruikshank, his Spouse, and of their Descendants. With an Appendix, containing Notices as to the Connections, by Marriage and otherwise, of many of that Family. Compiled from Authentic Sources, and now printed for the information of the said Descendants, in regard to whom the Details have been brought down to the Year 1860.

From this letter it is plain that Dun was at one time abroad; and it is also highly probable that, as suggested by Mr. Barrack, he studied medicine there. At any rate he made a good position for himself in a short time, for at the date of Sir John Hill's letter he was only thirty-four years of age, and then he had, in all probability, made his fortune. As a practitioner in Dublin he appears to have been highly esteemed; and his personal and social qualities must have been thought much of, for the next notice which I can find of him refers to his election to the Fellowship of the College of Physicians, the number of the Fellows being then limited.[b]

He was probably chosen a Fellow in 1676–7, that is, between January 1st and March 25th, 1677—new style.

In D'Olin's book, referred to in my Memoir of Dr. Stearne (p. 16, note), among the entries of Dr. Willoughby,[c] who was Treasurer from 24th October, 1677, to 18th June, 1680, is this statement:—

"De Doctore Dun pro admissione sua, £10. 00s. 0d."

This is without date,[d] but it precedes an entry which is dated Feast of St. Michael, 1678.

On the 24th of June, 1681, he was for the first time chosen President of the College of Physicians, probably on the death of his predecessor, Dr. Robert Waller; and he seems to have been annually elected to this office up to St. Luke's Day, 1687, when Dr. John Crosby was elected President. I shall shortly refer to the circumstances connected with Dr. Crosby's election—but, meanwhile, I may add that Dun appears to have again filled the highest office in his College in 1690, 1691, and 1692. On the 15th of December in this last year he was nominated the first President under the new College Charter of William and Mary; and he also was chosen President in the years 1693, 1696, 1698, and 1706.[a] So far as I have been able to ascertain, Sir Patrick Dun's contributions to medical literature were very few—the title of one, only, has come down to us, viz., a paper "On the Analysis of Mineral Waters," read before the Dublin Philosophical Society, of which he was one of the founders in 1683.[b] He was, however considerably in advance of his age in regard to practical anatomy; for it is stated that "the first record of a public dissection in this city, is that made by Mr. Patterson in 1684, of the body of a malefactor procured for that purpose by Sir Patrick Dun."[c]

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[a] Memoir of James Young, &c., *supra cit.* Note G., p. xii.

[b] See Charter of Charles II., in my Memoir of Dr. Stearne.

[c] Charles Willoughby, or "C. Willughby," as he signed himself in some letters of his which I have seen, was one of the Fellows of the College of Physicians, nominated in the Charter of 1667, and also in the charter of 1692. He was a physician of note in Dublin, and died in 1694. He left his library to T.C.D.

[d] The date of payment of fees is no fair index to the date of admission to Fellowship at this time, as in some cases the fees were paid when the person was made a candidate, and in others not until long after admission to Fellowship. The amount was often paid in two instalments, and sometimes a bond was accepted for the debt.

Of the original members of the Dublin Philosophical Society, Mr. (now Sir Wm.) Wilde, wrote:—"These men formed the *stellæ majores* of Irish literature and science at this period, and nearly every one of those of whom we have any subsequent account attained to considerable eminence either here or in England."

The very fact of Dun having been associated with Archbishop Narcissus Marsh, Provost Huntingdon, Sir Richard Bulkeley, Archbishop King, Bishop Ashe, Judge Loftus, Archbishop Palliser, Bishop Smith, and Sir Thomas Molyneaux, says much for his ability and energy of character, and gives, in a great measure, the key to his early and long-continued success in life. As noted with reference to another eminent physician,[d] it was not then the custom for medical men to write much on their own profession. They read much and wrote little, and what they did write was mostly on general literature, or, as was frequently the case with physicians at that period, on theology or ethics. If we consider the widely-spread prejudice which existed with regard to the practical study of anatomy in Dun's time, we shall be able, to some extent, to appreciate his public advocacy of anatomical science, and his known practice of it himself. His views on this subject will more largely appear on perusing his intentions as to the ultimate disposal of his property; but, meanwhile, it may well to say that, in the College of Physicians of Dun's earlier years, Trinity Hall,[e] anatomy, though pursued under difficulties which would damp the ardour of many a student in our day, was studied, and paid for, too. In fact, the practical anatomy of Trinity Hall seems to have, to some extent, served the purposes of our modern Dublin Pathological Society.

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[a] Register of the King and Queen's College of Physicians in Ireland, &c., 1866. Pp. 101, 102. In this book I have given all the authorities for the above statements, so that they need not be here repeated. See Preface to Appendix, p. 99.

[b] For a full account of this notable Society, the first of the kind in Ireland, see Mr. (now Sir William) Wilde's Contributions to the History of Medicine in Ireland. Dub., 1846 (reprinted from Dub. Quart. Journ. of Medical Science, Feb., 1846). In this Society Dun appears to have made powerful friends.

[c] Memoir of Sir Patrick Dun. Dublin Quarterly Journal of Medical Science, Vol. ii., 1846, p. 290.

[d] See my Memoir of Dr. Stearne, p. 38.

[e] For the history of Trinity Hall see my Memoir of Dr. Stearne.

Among the archives of the College of Physicians is a small book, bound in vellum, marked on the cover, "No. 7. Some old accounts," and inside, "An Account Booke of Receipts and Disbursements for the Colledge of Physitians, beginning Jan. 21, 1672." This record is evidently in the handwriting of Dr. Crosby, whose name has been already mentioned, and among the entries are the following:—

"It. to ye Joyner for ye dissecting table, the 15th of March, 1676, ...	6s.	0d.
"It. to ye Cutler for cleaning ye instrumts. belonging to ye College, ...	5s.	5d.
"It. to ye Carpenter for altering ye window shutts, .	2s.	0d.
"It. to ye Sexton of St. Andrewes[a] for keeping the dogg, Sixpence, ...		6d.
"It. for a Warrant for ye body it was dissected, . .	1s.	3d.
"It. to ye Souldiers who kept ye body, . . .	4s.	6d.
"It. for ye Coffin for ye sd. body, . . .	4s.	6d.
"It. to ye Souldiers who watched, . .	9s.	0d.
"For the said Souldiers in drinke, . . .	3s.	10d.

"The whole sum spent on ye same bod[y] being £2 4s. 10d., I delivered upon ye President's note unto his man."

This record shows one of the uses made of the College of Physicians when Dun was in a good position in Dublin. I assume that previous to his election to a Fellowship, he was a Candidate, *i.e.*, one chosen to fill a vacancy in the Society when such should occur; but he must have been not only a Fellow but a leading man in the College on the 4th of April, 1677, for under that date the Treasurer entered in the book from which I have just quoted:—

"It.: Payd. Mr. Boldey, of ye Castletauern, for a treate giuen Dr. Dunn vpon his address to ye College of Physitians agt. Lewis the Summ of 10s. 6d."

There is no record of Dun having taken any degree in the University of Dublin. I have searched the Rev. Dr. Todd's MS., "Graduati Dublinienses," from 1660 to 1712, but Dun's name is not to be found in the list. This, however, does not prove that he did not graduate there, as Dr. Todd's MS. list does not profess to be strictly correct, so far as including in it every actual graduate.

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[a] Trinity Hall was close to St. Andrew's Church.

As I have elsewhere remarked, it was customary at this time to go abroad for medical education and graduation, which was then a much easier process than such is now; because, at that time, Latin was the common language of learning of all kinds; and lectures could be heard and books read by an Englishman just as well at Utrecht as at Oxford. From Munk's Roll of the London College of Physicians, it appears that it was the almost invariable rule for those admitted to the Fellowship in that body, about this period, to have received their chief medical education abroad; and, on their return home, to have been incorporated, or admitted *ad eundem*, into one of our universities. As the Dublin College was founded on the London model, it is fair to suppose that the London example in this respect was followed here also; and, indeed, from Dr. Todd's list of graduates, it appears that this was actually the case in several instances, so that it may be presumed that Dun was, in like fashion, admitted *ad eundem*, or incorporated, at Dublin; and this supposition derives additional probability from the fact, that in his portrait, by Sir Godfrey Kneller, which is now in the college here, and to which further reference shall be made, he is depicted in the robes of a Doctor in Physic of the Dublin University; and from another picture of an M.D. of the Caroline period, to be seen in the Provost's house, it is plain that our medical custom and that in Dun's[a] time are identical.

From the earlier minutes of the College of Physicians it is apparent that Dun was a leading man in its concerns from the outset of his connexion with it. On all occasions of importance he was one of the few selected to represent the college before other public bodies, or in communication with the Government. Among other offices which he filled may be noted that of Censor, to which he was elected on five separate occasions subsequent to the issue of the present Charter of 1692: in 1694, 1695, 1697, 1699, and 1707.

Mention has been already made of Dun's friendship with certain remarkable personages in Church and State. Among these Archbishop King,[b] as he afterwards became, seems to have been his chief favourite. Dun was King's medical adviser; and, as will afterwards appear, the Archbishop was one of those to whom Dun entrusted the guardianship of his affairs by will. From the following letter may be seen Dun's plan of giving advice and gossip at the same time:—

"Reverend Sir,—I received yours of the 19 and 26, I am of

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[a] See Register of the College of Physicians for 1866, p. 26.

[b] William King—born at Antrim, 1650; Chancellor of St. Patrick's, Dublin, 1679; Dean, 1688; D.D., 1689; Bishop of Derry, 1690; Archbishop of Dublin, 1702; ob. at his palace, St. Sepulchre's (now a police barrack), 8th May, 1729; buried at north side of "churchyard of Donnibrook, near Dublin." See his life in "Harris's Ware (Bishops)." He founded Archbishop King's Divinity Lecture in the University.

Sr. Thomas Millington's[a] opinion that it is proper for you to drinke the waters, but cannot conceive why you may not drinke the bath also you have both time and season for both, when you see Sr. Thomas againe present my service to him, present my humble service to Sr. John and his Lady, she is certainly very good and mercifull if she can enduere to see any of you for your leaving her in Chester exposed to all the misfortuns that maye befall a traveller, when you see Sr. Robert Hamiltone tell him I receaved his letter, And that the committe have reported a Physitian necessary and that my Ld. Deputie told me that his Father might nominate whom he pleased, I praye you Sir faile not of your promise to faile often [*sic*] Mrs. Crofts left Dublin the 22d being teusdaye, the fridday after she was landed att Beumorrice theye were gone from Dublin before I received your first Mrs. Kerney is with her Mr. Kerney was maide King att arms Sunday last and his Sone herald the purchased it from Mr. St. George.

"I ame Sir
"Your faithfull DUN.

"June 2nd 1683.
"To the reverend
"Mr. William King,
"next door to the Cock in the Hay Market
"London."

The correspondence with King was of a very friendly kind, as may be seen from the tenor of the preceding letter. In the following year (1684) part of Dublin Castle was burnt. Dun was in court secrets at this time, having been Physician to the Lord Lieutenant, at any rate, since 1676, as appears by Sir John Hill's letter; and it is plain that he was looked on and acted as Physician to the State in 1676, although the office of State Physician did not regularly exist until 1725.[b] At any rate Dun was duly informed of everything that occurred about the Irish Court; and, as King was also of a gossiping turn, his medical friend kept him up in the latest news of things going on at home.

The following letter is curious in a historical as well as in an antiquarian point of view:—

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[a] Sir Thomas Millington, M.D.; educated at Westminster School; Fellow of All Souls, Oxon., 1859; Sedleian Professor of Natural Philosophy, 1675; Fellow Royal Coll. Phys., Lond., 1672; Knighted, 1679; President R. Coll. Phys., 1696 to his death. His praises were sung by Garth in his "Dispensatory;" and Sydenham spoke of him in terms of the highest respect. He died 5th January, 170$\frac{3}{4}$, ætat 75. He was one of the Original Members of the Royal Society; and was Physician to William and Mary, and Anne.—See Munk's Roll, R. Coll. Phys., Lond.

[b] Dr. Osborne in his "Annals" *supr. cit.*, says that Dun was State Physician; but Dr. A. Smith in his letter, now in the Archives of the College of Physicians, states that that office did not exist until 1725.

LADY DUN'S

……. dau. of John Goring, of Burton, Co. Sussex, Esq. = William Jephson, Esq., to whom King Henry VIII., granted the Manor of Froyle, in Hampshire. = Mary, dau. of William Gifford, of Sunborne, 2nd wife.

William Jephson, of Froyle, Esq., High Sheriff of Hants, 1571: 14 Elizabeth. = Mary, dau. of John Dannett, of Dannett's Hall, in Leicestershire, Esq., by ………. dau. and heir of………. Elingbridge, of Elingbridge.

Christian, wife of Richard Whitehead, of East Tytherley, in Hants.

Elinor, wife of George Burley, of Potternese, in Wilts.

Editha, wife of Walter Hickman, Esq., ancestor of the Earls of Plymouth

Sir William Jephson, of Froyle, Knt, knighted by King James I., 23rd April, 1603. made his will, which was pr. in London in 1616: he died without issue, 1614.

Elizabeth, dau. and sole heir of Sir Thomas Norreys, Knt., Lord President of Munster, and Justice of Ireland, 5th son of Sir Henry Norreys, of Rycot, in Berkshire, and uncle to Francis, Lord Norreys. = The Rt. Hon. Sir John Jephson, Knt., of Moyalloe, or Mallow, in the Co. Cork, in right of his wife, a Privy Councillor, M.P. for Hants, 1620, knighted by Sir Geo. Carey, Ld. Deputy of Ireland, 18 Dec., 1603, died 16 May, 1638. His Will prd. in London, 1638. He was also of Froyle, in Hampshire, as heir to his brother. = Mary, dau. and heir of Sir Henry Duke, of Castle Jordan, in Co. Meath, Knt., and relict of Sir Francis Rush and Richard Gifford, Esqr.

William Jephson, of Froyle, and also of Mallow, Esq., ancestor to Sir Chas. Denham Orlando Jephson Norreys, Baronet.

Norreys Jephson, Esq., 2nd son of Sir John Jephson, a Col. in the army, died before 1653. = Eleanor, dau. of Sir Henry Colley, of Castle Carberry in Kildare, Knt. She was a widow, 1656.

Col. John Jephson, 3rd son of Sir John Jephson, of Mallow. = Bridget, dau. of the Most Revd. Richard Boyle, Lord Archbishop of Tuam, and sister of Michael, Archbishop of Armagh.

Norreys Jephson, Esq., only son, and heir.

Very Revd. Wm. Jephson, Dean of Lismore. = Anne. dau. of Redmond Barry, of Rathcormac, Co. Cork, Esq.

Very Revd. Michael Jephson, D.D., Dean of St. Patrick's, Dublin. Will dated 28 Dec., 1693, prd. 7 Feb., 1693.

à quibus
Sir Richard Mountney Jephson, Bt.

PEDIGREE.

Anne, wife of Thomas Dixie, ancestor to Sir Wolstan Dixie, Bart.

Catharine, wife of John Jewell.

Elizabeth, Wife of Sir Edmond Mervyn.

Henry Mervyn, of Durford, in Sussex.

.........wife of Henry Lucas, of Suffolk, and Froyle, Hants.

Philippa, dau. of Sir Henry Neville, of Billingbere.

Thomas Jephson, 4th son.

Bartholomew Purdon, Esq. = Elizabeth, wife of Sir John Gifford, of Castle Jordan, in Co. Westmeath, Knt. She survd. her husband, who died 24 April, 1657.

Bartholomew.

Frances, wife of Woolrich, of Hants.

Mary wife of .... Paulet.

Theodosia.

John Jephson, of ... Esq. = ... dau. of Richd. Maguire, of Limerick, Esq.

Mary Jephson, wife of Sir Patrick Dun, Knt., M.D., married 11th Dec., 1694.

Boyle Dun, only child, died young.

Elizabeth, wife 1st of Wm. Becket, Esq., 2ndly of Sir John Topham, Knt.

Catharine, wife of Col. Wm. Richardson, of Rich Hill, in Armagh.

"Reverend Sir,—I have heard my selfe some false circumstances about the burning of the Castle in Dublin, therefore I give you the following accont thereof: the fire began in my Lord Deputys dressing room, in the new buildings built by the E. of Essex, the Crakling noise and smoake of it weakened my Lord Deputy[a] out of his sleep, he gott up and was goeing out his usuall waye out of his bed chamber by his dressing room, this dressing room is in the east end of those buildings a back room betwixt the bed chamber and the castle wall, upon opning the dore of that dressing room, so much smoake and heate struk my Lord in the face that it almost took his breath from him, whereupon my Lord retreated in his shirt toward the other door out of his bedchamber and called out fire fire, sent to save his daughter and sent for powder to blow up his closet and long gallerie, to hinder the fire from goeing toward the northeast tower which looketh into Cork house Exchange and is full of powder, before this was done all those new buildings were burnt and my Ladys drawing room in which she receaved the Ladys, was in fire, to stop the progress of the fire towards the dining room, my Lord Deputy ordered the presente to be blown up, Mr. Robinson was not in town, my Lord and Mr. Cuf were the ingeniers, which was done and stopt the fire from fireing the dining room there was burnt and blown up, the new buildings built by the Earle of Essex, my Lords closet and the long gallerie and all betwixt the new buildings and the tower on which the Clock stood, the fire began on Sunday betwixt on and 2 in the morning its progress was stopt about 4, but my Lord Deputy was not drest till about six, all his cloaths were burnt, and furniture of those new buildings, Mr. Kingdon and the Earle of Longford furnished my Lord with linning and a suite of Clothes the City of Dublin had a greate deliverance, by the powders being saved for which we are all bound to bless God I present my service to Sir John Parker and his lady Mr. Kerney King at Arms was Knighted Sunday last.

"I ame Sir
"Your humble servant Dun.

"April 8 1684.
"To the reverend William King
"at Sir John Parkers house
"in Formoyle
"to be sent by the post to
"Lainsburrow."

Drinking the waters at the wells near Wexford was a fashionable medical pastime at this period, and, of course, Dun had to send his patients there, and give them advice too. The following letter has not any address on it; but it was probably intended for King. The next, dated 3 Aug., 1686, very fairly illustrates the medical practice of Dun; and also shows how he got into and retained the good graces of influential friends. The "Mr. King" mentioned in this, and in the third letter, dated 28 April, 1688, was the future Archbishop's brother, Mr. Robert King, of Skinner-row.

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[a] Richard Butler, Earl of Arran, second son of James Duke of Ormond.

"Reverend Sir,—This is only to introduce the bearer hereof Mr. Sample to your acquaintance and because he is a stranger, to beg of you the favor; to be assisting to him in providing a lodging for a gentlewoman whom I have advised to drinke the waters, Captaine Morrice told me this morning that he had secured a lodging for his Lady I suppose it may be in the same house where you are if ther can be no other lodging got, att lest endeavor that this gentlewoman maye have Madam Morrice lodging till she come, by his discourse with me, I suppose she will try the new found well att Chapel Izod. I promised to give her a visite to morrow I suppose then she will fixe her resolution, this daye my man receaved the inclosed from the post office, I left my patient very well yesterdaye, she had only the measls, present my most humble service to my Lady Cole,[a] I have not forgot my promise either next week or the the week following I intend to see her Ladyshipe att the wells,[b] I wish you all good success.

"I ame Sir
"Your most humble servant
"DUN.

"Dublin, June 6, 1684."

"Sir,—I am very glade that you gott so well to Wexford I hope that your cough you had after your first and second dayes drinking will be much abaited before this come to your hands, I praye you not to be discouraged with the first rencounter, for many have not only found themselves disordered at first but all the time theye drank ye waters and yet have found greate benifite afterward I desired you to take halfe ane ounce or ane ounce of the syrup of buckthorn in the first glass of your waters if they did not pass, according as you found there was more or less necessity of purging and to drink the waters after as if you had taken no such thing I praye you lett me heare oftner from you, and if your stingie scant waters cannot inspire you in a morning, I hope after dinner when you have drunk a glass or two, of good Claret (if the toun can afford it) you maye find some matter to write, particularly about our Bishop of Raphoe[a] whom I have recommended to your directions, as my Deputie, as also our Lady Majoress,[b] Mrs. Saffeild my patient, Mrs. Dean, to whom with my most humble service I wish much joy of her new Sister, to the widiow and her Daughter, I charge you upon your &c. not to saye a short grace for her, but bring her to Dublin safe and single as you found her att Wexford so help &c. yesterday Mr. Johnston was with me, we discoursed about the house, after he had heard all I had to saye, that we had nothing to saye to the house on the terms send to us from the Naas &c. and that we had given leave to Mr. King to take it in his oun Name that he had sent a lease to Mr. Leigh with a letter of recommendation from Mr. Whitshed &c. he told me that what he had signed in our favors he would stand to it if we required it but prayed that we would not oblidge him to extend it to any other, and in short gave me to understand that he had a mind for the house himselfe I waved giving him any answer, Mr. King is acquainted by this post, I present My Most humble deuty to My Lord Bishop of Raphoe his Lady our Lady Majoress, Mrs. Saffeild, Mrs. Dean and the Widow, make ready your treate for Dr. Willoughby and myselfe when we come I wish you all good success.

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[a] Lady Cole—probably Elizabeth, *d.* of Jno. Chichester, Esq., of Dungannon, and wife of Sir John Cole, Bart., of Newland, Co. Dublin, and M.P. for Co. Fermanagh; *or* her *d.*, Elizabeth Cole, who *m.*, in 1671, Sir Michael Cole, Knt., son of Sir John's elder brother, Sir Michæl Cole, M.P. for Enniskillen, and ancestor of Wm. Willoughby Cole, the present Earl of Enniskillen.

[b] Wexford water, a chalybeate. Fashionable invalids resorted to the wells in Dun's time, and for many years after. See Rutty on Mineral Waters, p. 143. Dublin, 1757.

"I am Sir
"Your most humble and faithfull Servant,
"DUN.

"Dublin 3 August 1686.
"To the reverend
"Mr. William King,
"Att the wells near
"Wexford."

"Reverend Sir,—I hope this maye find you in good health which is my particular prayer, I ame now att Moyra with Sr. Arthur Randon I came to this place yesterday being fridday, in the afternoon, this daye being very cold and wett my Lady would not lett me goe, I told her if she keept me this daye I would not goe on Sunday, on Munday God willing I leave this and Know nothing to hinder me, but a passing visite to Dr. Warren 4 Miles from this and another att Droghedah to my Lord Forbess I hope att furthest I maye dine with you on wednsdaye, I visited in my ramble Dr. Warren, the Bishop of Drummore[a] who asked kindly for you and drank your health, Sr. John Mc Gill, Sr. Wm. Franklin James Hamiltone of Newcastle, who now liveth att Bangor he often remembred you, James Hamiltone of Kilmore, Sr. Arthur told me he had a letter from Mr. King since his returne from circuite present my service to him and his wife and Daughter to Dean Leslie, my Lord Bishop of Kilmoore,[b] Mr. Bonell.

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[a] William Smith, D.D.; born at Lisnagarvy, Co. Antrim; educated at T.C.D.; Vicar of Ardnogher, Dio. Meath; Dean of Dromore, 1673; Bishop of Killala, 1681; translated to Raphoe, 1681; and thence to Kilmore, 1693. Ob., 24th Feb., 1698, and buried in St. Peter's Church, Dublin.—See Harris's Ware.

[b] Wife of Sir John Castleton, Lord Mayor of Dublin in 1686.

"I am Sir
"Your most humble and
"Faithful servant
"DUN.

"Saturday 28 of April 1688.
"To the reverend
"Mr. William King
"To be left att Mr. Robert Kin'g house
"in Skinner Row in
"Dublin."

At the time of the Revolution of 1688, Dun was a partisan of the winning side. He got appointed "Physician to the Army in Ireland," and, in that capacity, he accompanied King William's army, and was present at some scenes of historic interest. His friend King was now a Doctor in Divinity, and Dun appears to have written to him an account of everything that occurred, judging from the following letters:—

"Reverend Sir,—I gott to the Camp on Munday night late and could not find Sr. Robert Suthell,[c] on teusday morning early we were commanded away with the army designed for Waterford, it was surrendred yesterday. the King went thither, but the Irish were not marched out, the King did not goe into the toun, he rid about part of the walls and marched away to Major Gen. Kirk's tent dined there, returned to Carik whether, I could not gett before this night, just as I came Sr. Robert received ane express from England I could not gett access to speake with him, I delivred your letter to Mr. Waller who promised to deliver it the first opportunity, the news by the express is that the french are on their own coasts and all agree in England to oppose the French, and all is well there, the King sent away his baggage this morning, he will be with you in Dublin on Munday and goeth for England in a few dayes, Count Solms is left generall, Gen. Douglass forces and ours meet att goldn Bridge neare Cashel, we expect that this night or to Morrow morning Dunganon will be surrendred, we march to Clonmel we know no more, I wrote this night to Coll. Venner since I went to the Treasury office Mr. Cunisby had not sent the order for the money therefore I did not leave the office before I saw Mr. Robinson write a letter to Mr. Fauns to supply the Coll. with a hunder pound on Demand, Mr. Fauns will be found att the Custom house Cork house I have told Dr. Hutton that you can deliver to him his gold, the Key of my Closet where it is and all my other Keys are in the blak Cabinet in the outer room, If you cannot easily find the box brake it open accommodat Dr. Hutton as well as you can, we expect that Youghall and Cork will soon surrender they will not lett me write any more.

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[a] Capell Wiseman, D.D., son of a Baronet in Essex, Fellow of All Souls Coll. Oxon., and Chaplain to Arthur Lord Capell, Earl of Essex and Lord Lieut. of Ireland, who was his godfather. Promoted to the Deanery of Raphoe, and thence, in 1683, to the See of Dromore. Obiit. 1695.—See Harris's Ware.

[b] Wm. Sheridan, D.D., born at Togher, Co. Cavan; educated at T.C.D.; Dean of Down; Bishop of Killaloe, 1669; translated to Kilmore, 1681. His elder brother, Patrick, was Bishop of Cloyne. Wm. Sheridan was deprived of his See as a non-juror, and lived in London many years afterwards. Obiit. 1716.—See Harris's Ware.

[c] Principal Secretary of State for Ireland. Obiit. 1702. Ancestor of Viscount Southwell.

"I am Sir
"Your most humble and
"Faithfull servant
"Dun.

"Carik 26 July 1690.

"Dr. Hutton's cloke is hanging behind my bed.

"To the reverend
"Doctor William King
"att his lodgings near the the Dolphin
"in Skinner Row
"Dublin."

"Reverend Sir,—This morning I spoke with Sr. Robt. Suthwell he assured me he would serve you before any man in Ireland and expresed himselfe with all the kindness imaginable you may rely on him[a] be as as kind as you can to Dr. Hutton I must follow the army

"I am Sir
"Your most humble and faithfull servant
"Dun.

"Carik, 27 July.

"To the reverend
"Dr. William King
"att his lodgings in Skinner row
"neare the signe of the Dolphin in
"Dublin."

"Reverend Sir,—Before I received your letter and our Landslords the best of the horses were gone, theye were sold the daye I came to Waterford, I could not trust to my oun skill I tooke Mr. Persivall and Mr. Hogshaw's advice, they could not please themselves, I gave to one coming to Dublin a note of Direction to come to your lodging, he hath a baye horse to sell; I gave another letter to one Thomas Johnston who hath a Nag and a small Mare, this is by Dr. Hutton's servant who hath a horse or two of his Masters to sell, you maye give more credit to him and Mr. Johnstone then to the first, Dr. Le Can is coming from the Hospitall neare Dublin to relieve me I hope to be with you in a few days after his arrival he cometh by sea to Waterford, I praye you doe me the favor to send your servant to look out a stable for a night or 2 for 5 horses till I gett time to send them to grass We are dayly expecting to heare of Ld. Malburgh landing some where in Munster, greate guns and ammonition, pikaxes, spads, shovels, granadoes are loaded ready to saile by his order, it is supposed the design is against Cork and Kinsale the army is neare golden bridge but many are gone into Winter quarters, we have a garrison still at Castle Connell within 4 Miles of Lymrick, att Carik in Lish within 5 miles and att all the places our army was possest of neare Lymrick, I give my humble service to Mr. and Mrs. King and theire Daughter

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[a] From this it is plain that Dun had strong influence with Government, and used it on behalf of his friend King, whose promotion followed very soon after this date.

"I am Sir
"Your most humble servant
"Waterford 16 Septr. 1690. "Dun.

"To the reverend
"Dr. William King
"att his lodging in Skinner row
"neare the signe of the Dolphine
"in Dublin."

HIS PARLIAMENTARY CAREER.

Having succeeded in his profession, and feeling ambitious of public honours, Dr. Dun decided on entering Parliament; and, accordingly, he became a member of the Irish House of Commons in 1692. On the 27th of September in that year he was returned member for the Manor of Mullingar; and on the 29th of the same month he was also returned for the borough of Killyleagh, Co. Down. He elected to sit for the latter[a] on the 23rd August, 1695. He was a second time returned for Mullingar, for which manor he was for the third time returned on the 1st September, 1703.

He does not appear to have done much in the House, for the only entry which I can find respecting him, in his legislative capacity, is that on the 1st June, 1709, he was chairman of the committee which was appointed to report on the petition of John Hunt, who sought for a reward for his discovery of a method of refining foul and muddy malt drink.[a] The fact of his double return as M.P. says much for his popularity; and it may be remarked that at this time it was not rare for medical men to sit in Parliament, for, in the Parliament of 1695, beside Dun's name, I find those of two others, namely, Christopher Irwin, M.D., who sat for the County Fermanagh, and Thomas Molyneaux,[b] M.D., who sat for the borough of Ratoath, County Meath. There is another entry respecting Dun among the Irish Parliamentary Petitions. From this it appears that Arthur, Earl of Granard, owed Dun money, for which he paid ten per cent. interest; and respecting the debt, the latter petitioned the House of Commons, on the 24th of July, 1707, to have a charge put on Lord Granard's estate. The Earl presented a petition to a like effect on the same day.

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[a] Journals of the Irish House of Commons, 10th October, 1692 (Vol. ii., p. 11).

HIS CONNEXION WITH THE COLL. OF PHYS. CONTINUED.

THE CHARTER OF 1692.

Dr. Stearne, the first President of the College of Physicians, died on the 18th November, 1669, and his place does not appear to have been soon filled up. On the 27th January, 167$\frac{0}{1}$, Dr. Margetson[c] and Dr. Howard, on the part of the Physicians, notified to the Provost of T.C.D. that the Presidentship was vacant; and in accordance with the terms of the Physicians Charter (that of Charles II.), the Board of T.C.D. proceeded to elect, and appointed Sir Abraham Yarner, Knt., M.D., to the vacant office.[d]

Sir Abraham Yarner was probably re-elected in 1672 and 1673. In 1674 he was succeeded by Dr. Ralph Howard.[e] The chair was filled in

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[a] App. to Journals, p. cciii.

[b] Afterwards Sir T. Molyneaux, Bart. (a younger brother to the celebrated philosopher, William); born in Dublin; educated at T. C. D., at Leyden, and at Paris; M.D. Dubl. 1687; afterwards Regs. Prof. of Phys.; Phys. to the State, and Phys.-Gen. to the Army; F.R.S. He was one of the Fellows of the Col. of Phys. nominated in the Charter of 1692; in 1798 he resigned his Fellowship, and was chosen Hon. Fell.; he was created a Baronet in 1730, and died 19th Oct., 1733. In "Harris's Ware," (which see for his life and writings), it is stated that he "practised in his faculty with great reputation till his death."

[c] Thomas Margetson, one of the Fellows nominated in the Charter of 1667. For an account of him see "Monk's Roll of R. Coll. Phys." London, Vol. i.

[d] Barrett's MS., p. 71—the form of the instrument in this case is given by Dr. Barrett. See, also, Register of Coll. Phys., 1866, p. 101. Sir A. Yarner's daughter, Jane, was married at St. Michan's, on 4th Aug., 1663, to Sir John Temple, and from them was directly descended the late Lord Palmerston.

[e] Ralph Howard, of Dublin, M.D., made his will 6th January, 1709 (proved 8th Oct., 1710). In it he names his sons, Hugh, Robert, Bishop of Killalla (afterwards of Elphin), and William, of Dublin; and his daughters, Dorothy, wife of Anthony Dopping, and Catharine, wife of Dr. Thomas Molyneux. The Bishop's eldest son, Ralph Howard, the first Viscount Wicklow, was grandfather of the present Earl of Wicklow.—(Information from Sir B. Burke.) Ralph Howard is the Dr. Howard above mentioned. He became M.D. Dubl.; and a Fell. of Col. of Phys. in 1667; Regs. Prof. of Phys. in 1674; and died in 1710.

1675 and 1676 by Dr. Charles Willoughby; in 1677, 78, 79, and 80, by Dr. Robert Waller;[a] and on the 24th June, 1680, Dr. Patrick Dun was first chosen President, as already noted, and he was probably re-elected annually up to 1687, when a controversy took place between the College of Physicians and the Provost and Senior Fellows of T.C.D. This controversy affected the independence of the former body, and it doubtless led to the subsequent successful application for the new Charter, which, by Dun's influence, was granted by William and Mary. In Barrett's MSS. (p. 71) this affair is thus quaintly described :—

"Oct. 26, 1687. Dr. Connor and Dr. Dunn came to the College to signify that the College of Physicians had chosen Dr. Crosby for their President, and did desire the Provost and Senr. Fellows to confirm their election. The answer that was given to them was to this purpose: that upon restoring Trinity Hall to Trin. Coll. in the [year] 1680, there were articles drawn up and agreed upon between Trin. Coll. and the College of Physicians, and that both Colleges did enter into bonds of £300 each to the other for the performance of the said articles. And that one of the articles required that the Register of the College of Physicians should be one of those that should signify the election of the Prov. and Senr. Fellows. Another was that Trinity College did oblige themselves to confirm the election of the College Physicians, provided the person elected were a Protestant of the Church of Ireland, and that seeing their Register was not there, and that the person whom they had elected was not a Protestant of the Church of Ireland the Provost and Senr. Fellows did not think it safe nor proper for them to confirm the election of the said Dr. Crosby."

On the 11th Nov., in the same year, the College of Physicians proposed to cancel the articles of agreement made in 1680, and the bonds relating to this agreement. To this the Board replied that "If the Coll. of Physicians will deliver up all the writings that relate to Trin. Hall which are in their custody, and also give a release of all former grants and deeds made by Trin. Coll. to the Coll. of Physicians, concerning the said hall, that then Trin. Coll. would consent that the aforesaid articles and bonds should be cancelled. Trin. Coll. further proposes to set a lease of Trin. Hall for 40 years to the Coll. of Physicians on such terms as shall be agreed on."—Barrett's MSS., p. 72. On the 19th May, 1688, the College of Physicians again requested the confirmation of Dr. Crosby's election, and were again refused on the former grounds.

The College of Physicians seem to have resolutely adhered to their choice in Dr. Crosby's case, and to have been supported in their conduct by Dun himself. About this time we lose all traces of Dr. Crosby, who, probably either died or left the country, like so many other Irishmen at this critical period.

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[a] One of the Fellows nominated in the Charter of 1667. He was also a Fellow of the London College; M.D. of Leyden; incorporated at Cambridge 1652; and admitted *ad eundem* at Dublin, 1664. See "Munk's Roll," *supr. cit.*

Dun having been an influential supporter of this college was, on St. Luke's Day, 1690, chosen to succeed his non-confirmed predecessor; and his election was at once confirmed, as appears by the following entry in Barrett's MSS. (p. 72):—

> "Oct. 18, 1690. An instrument was sealed and signed by the Register to constitute Dr. Dun President of the Coll. of Physicians for the year ensuing."

Dun was probably re-elected in 1691 and 1692; and during those years, seeing that unless independent in the choice of their president the college could not work well, and that the powers conferred by the charter of Charles II. were wholly insufficient to check the practice of quackery and empiricism; he induced the college to petition Lord Viscount Sydney, then Lord Lieutenant, for a new charter similar to that of the London college. In this petition were also included requests for one of the forfeited houses, to be used as a college hall, and five or six acres of land near Dublin for a physic garden.

The petition was referred to Sir John Temple, then Attorney-General for Ireland;[a] on September 3rd, 1692, he advised granting its request; it was forwarded to their Majesties; and on the 29th of the same month Lord Sydney received a royal mandate to have the new charter issued. On the 14th of December, 1692, the original charter of Charles II. was surrendered to the Lord Chancellor by Dr. Duncan Comyng;[b] and the new one was probably given on the following day. It is dated 15th December, 1692, and under it, and some subsequent acts of Parliament the college is now governed.

It is not necessary to give here a full copy of this charter, which Dun was chiefly instrumental in procuring, as it has been, twice at least, printed since 1692. The copies printed at the University Press in 1856 are now easily attainable; and this latter edition having been compared with the original, and certified to be correct, by so accurate a gentleman as Dr. Steele, who was at that time Registrar, I need give no more than a table of contents of the Charter of William and Mary, which may be useful, not only to the student of medical antiquities, but may also assist in the conducting of business at meetings of the president and fellows:—

TABLE OF CONTENTS OF THE CHARTER OF 1692.

The numbers prefixed denote the Sections.

I. Recital of the Patent of Incorporation by King Charles the Second.

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[a] Who married Sir A. Yarner's daughter, as before noted.

[b] Chosen Fellow about 1684; and nominated in the Charter of 1693. Obiit, 1724.

II. Preamble to this grant.

III. The grant—Body politic—Perpetual succession—Capable to purchase—To grant and dispose—To sue and be sued—To have a common seal—Seal may be changed—College to consist of fourteen Fellows,[a] one President, and four Censors.

IV. The first fourteen Fellows (names)—To hold office for life if not removed for cause.

V. Dr. Patrick Dun appointed first President.

VI. First Censors to continue to the Feast of St Luke.

VII. Elections to be made, how and when.

VIII. Time of election of President—President to be sworn.

IX. Election of President when a vacancy occurs.

X. President to appoint a Vice-President.

XI. Election of four Censors—Censors to be sworn.

XII. Election of Censors in case of death or removal.

XIII. How the Fellows are to be chosen—Election of Fellows.

XIV. Power to summon and admonish Censors and Fellows—Power to remove or expel Censors or Fellows.

XV. Each Fellow to have but one vote—The President, or Vice-President, to have a casting vote when voices even.

XVI. Officers to be sworn to faithful execution of their duties—Oath and declaration.

XVII. Persons by whom oaths to be administered to first President, Censors, and Fellows.

XVIII. The Censors, or any two of them, to swear in future Presidents—The President, or Vice-President, to swear in Fellows and all officers thereafter chosen.

XIX. College to have a Common Hall—President to call a Court—Court to consist of not less than five Fellows, of whom the President, or Vice-President, shall always be one—Shall have power to treat of matters—To make laws and orders—To inflict punishment upon offenders by fines or imprisonments.

XX. No person to practise physic in Dublin, or within a circuit of seven miles thereof, but those licensed by the President and Fellows,[b] under a penalty of ten pounds for every month—Power to sue for the same.

XXI. Power given to the President, or Vice-President, and two

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[a] By Statute 1 Geo. III. cap. 14, sec. 1 (made perpetual by 30 Geo. III. (1790) cap. 45, sec. 2), commonly known as "Lucas's Act;" this limitation as to numbers was removed.

[b] This restriction was removed by statute 21 and 22 Vic. cap. 90 (the Medical Act), which empowers every registered practitioner to practise in any part of Her Majesty's dominions.

Censors, to supervise, examine, and punish practisers of physic, apothecaries, druggists,[a] &c., &c., within the aforesaid limits.

XXII. Power given to the President, or Vice-President, and two Censors, to summon and examine all practisers offending within the limits—If they refuse to appear, or refuse to answer or be examined—To fine them for not appearing, or refusal to answer, a sum not exceeding forty shillings—Also power to fine or imprison for giving unwholesome physic; the fine not to exceed ten pounds, nor the imprisonment fourteen days.

XXIII. Power to summon persons by precept, under hand and seal, and to examine witnesses on oath, touching their knowledge of said offenders—Penalty for non-appearance or refusal to answer questions, twenty shillings.

XXIV.—Three of the Censors shall have power to enter the house, shop, &c., of any apothecary, druggist, &c., and search for, view, try, and examine all medicines, wares, drugs, &c., there kept for sale; to examine upon oath concerning the same; and to destroy all defective or corrupted medicines[b]—Penalty for opposing search, forty shillings.

XXV. President, or Vice-President and two Censors, may summon before them any apothecary or druggist in Dublin, or within seven miles thereof—Penalty for non-appearance not to exceed twenty shillings—Penalty for improper compounding not to exceed three pounds—May imprison until fine be paid.

XXVI. All persons desiring to practise physic in the country, without the aforesaid limits, shall offer themselves for examination to the President, or Vice-President and Fellows.[c]

XXVII. Power to the President, or Vice-President and three Censors, to summon and examine all practisers of physic without the limits aforesaid—To grant license to those qualified, and to reject those not duly qualified for the same.[d]

XXVIII. None (excepting graduates in the Universities of Cambridge, Oxford, or Dublin) to practise physic outside the limits aforesaid, unless licensed, under a penalty of five pounds per month.[e]

XXIX. Plaintiffs shall have their costs of suits brought to recover the above-mentioned penalties. *Provided always* that graduates in physic of the University of Dublin, having performed their full acts, be admitted into the College, without further examination, on payment of the usual fees.[a]

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[a] So far as apothecaries, druggists, &c., are concerned, this power was enlarged and confirmed by 9 Geo. II. cap. 10, which, after several re-enactments, was transformed into Lucas's Act, still in force. For the provisions of this, see Register K. and Q.C., P. 1866, p. 11.

[b] Confirmed by Lucas's Act.—See Note to Clause XXI.

[c] See Note to Clause XX.

[d] See Note to Clause XX.

[e] See Note to Clause XX.

XXX. Power to examine and license midwives, and to punish those not licensed—All fines, penalties, &c., to be approved by a Court, and registered, before being levied—Appeals for relief from fines or penalties to be made within one month to the persons hereafter nominated.

XXXI. Visitors constituted.[b]

XXXII. Power of Visitors to hear and adjudge appeals—May remit causes back again to the President and Fellows.

XXXIII. All judgments made by the Visitors to stand good, without further appeal.

XXXIV. In case appeals be not prosecuted within six months, the President and Fellows may proceed in every such cause, sentence or decree, as if no appeal had been made.

XXXV. The President and Fellows to proceed on judgment on appeal (after remitted), as in other cases before.

XXXVI. Offenders to be questioned or punished within one year after the offence.

XXXVII. All fines given to the President and Fellows, with power to sue for and levy same.

XXXVIII. Fines to be distributed amongst the poor of the parishes or places where the offences were committed. The President and Fellows to pay six pounds, yearly rent, to the Crown.

XXXIX. Power to appoint one of the Fellows as Registrar. His duties. Other officers may be appointed. Registrar and other officers to be sworn.

XL. Power to take recognizances of offenders, and to commit to prison persons refusing to enter into recognizances.

XLI. Gaolers to obey the warrants of the President and Censors, and safely keep all persons committed in their prisons. Penalty for doing the contrary, double the fine for which the person shall be so committed to their charge. Provided such fine be not above twenty pounds: one half to go to the Crown, and the other to the President and Fellows, for the use of the poor, as aforesaid.

XLII. Liberty to take annually for dissection the bodies of six persons executed for crime, in the city or county of Dublin. Provided that after such use they be decently buried at the costs and charges of the said President and Fellows.

XLIII. Liberty to purchase lands, of a clear yearly value not exceeding two hundred pounds sterling.

XLIV. Members of the College to be exempt from serving on juries;

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[a] Repealed by 40 Geo. III., cap. 84, sec. 85 (School of Pysic Act).

[b] Confirmed by Statute 40 Geo. III., cap. 84, secs. 38-40; which also confirmed clauses XXXII. and XXXIII.

from being chosen as churchwardens, constables, &c.; from all watch and ward; and from bearing and providing arms, within the city of Dublin or within seven miles thereof.[a]

XLV. Every Apothecary in Dublin or within seven miles thereof, shall before taking an apprentice bring him before the President and Censors to be examined touching his knowledge of the Latin tongue. Penalty for infraction, not to exceed twenty pounds sterling.

XLVI. These Letters Patent to be good, firm, and effectual in the law.

XLVII. If enrolled within six months, in the Rolls of the High Court of Chancery in Ireland.—15th of December, in the fourth year of our reign. Witness. DOMVILE.

WHAT BECAME OF TRINITY HALL.

The grant of the new charter to the College of Physicians was probably made with the consent of the Board of T.C.D.; for their privilege of electing the President seems to have been given up without any protest on their part. For this reason I am inclined to think that the Board received the *quid pro quo*, in the shape of the College of Physicians yielding to the demands contained in the proposal made by the Board in 1687, to cancel the agreement of 1680. (See Barrett's MSS., *supr. cit.*, p. 72.) If such occurred, as is more than probable, it may be assumed that Trinity Hall reverted to the Board in or about 1693, and nearly all that is subsequently known of it, I have detailed in my memoir of Dr. Stearne (p. 28), before referred to. It will be observed that in the proposal to cancel the agreement it is distinctly stated that all the writings relating to Trinity Hall should be delivered up to the Board of T.C.D.; and this gives a probable solution as to what became of various documents which the College of Physicians must have had while occupying Trinity Hall. The only two books of that period now in possession of the College have been referred to and quoted from already;[b] and they contain internal evidence of the existence of minute books, which are now lost. It appears that during the provostship of Dr. Baldwin many valuable papers belonging to T.C.D., extracts from which Dr. Barrett copied, were lost; and no account can be got of them. I may say here in passing, that from one of the books just noted it appears that Mrs. Stearne, widow of the first President, occupied Trinity Hall, as a residence, for several years after her husband's decease; and paid the College of Physicians rent for her lodgings.[c]

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[a] Confirmed by the Medical Act, and extended to registered practitioners everywhere.

[b] D'Olins' book, described on p. 28 of my memoir of Stearne; and "No. 7 Old Accounts," *supr. cit.*

[c] In the Provost's house there is, among the heir-loom portraits, one of a Doctor of Physic, name unknown. I believe it to be a portrait of Dr. Stearne.

The College of Physicians must have given up Trinity Hall on the surrender of the old charter, for Dr. Barrett records the appointment of a tutor in arts as master there on the 9th of July, 1694.[a] From this it appears that in 1694 it was given up to the purposes of general education. The next entry respecting it in Dr. Barrett's MSS. is "Nov. 21, 1694. Lease ordered of Trin. Hall for 41 years to Math. Shaw;" and his last notice of it is: "24th Jan. 1710, two leases to Dr. Jn. Barton, of Trin. Hall perfected for 40 years."

Among other evidence laid before a committee of the House of Commons on the 16th December, 1783, on the School of Physic question, Dr. Dabzac,[b] who was a Senior Fellow of Trinity College at that time, deposed that "Trinity Hall reverted to Senior Fellows, and is now [1783] in the possession of ye University." In *Gilbert's History of Dublin*, (iii. 17), it is stated that "a portion of its site is occupied by the Alms House of St. Andrew's Parish."

THE COLLEGE BEGINS TO MEET AT DUN'S HOUSE.

The first meeting of the college under the new Charter took place on the 7th January, 169$\frac{2}{3}$; and it probably was held in Dr. Dun's house on the Inn's-quay.[c] From the minutes of this period it seems that the subject of our memoir was very energetic in claiming privileges under the new Charter; for, under date of Feb. 18th, 169$\frac{2}{3}$, it is recorded that he and the fellows demanded from the Sheriff and obtained the body of a malefactor executed the same day; and Dr. Gwythers,[d] one of the fellows, was appointed to dissect it. Shortly after this (March 1st) Dun had a quarrel with Dr. Ralph Howard, another fellow, and it is stated that they submitted to the decision of their brethren in the matter; for, "the censure of the college being read to them they accordingly allowed of and complyed with it, and are now in presence of the college returned to their former friendship." On the same day it was recorded that the body of the criminal had been dissected, and duly interred.[e]

HIS MARRIAGE, AND HIS SON BOYLE.

On the 11th of December, 1694, Dr. Dun took the important step of getting married. By this act he became connected with some of the best and most influential families in this country.

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[a] "Sir Smith chosen Master of the School in Trinity Hall."—Barrett, MSS., p. 74.

[b] Henry Dabzac elected Fellow 1760; co-opted vice John Stokes, 1775. Died 12 May, 1790.—Dub. Univ. Calendar.

[c] This may be inferred from the College Journal.

[d] Charles Guither or Gwythers, M.D., Dubl., 1688, one of the Fellows nominated in the Charter of 1692; he died in 1700.

"Dr. Gwythers, a Physician and Fellow (probably of Coll. of Physicians), brought over Frogs in 1692 from England, which were first in the ditches of the Coll. Park. See Swift's Works, note Tatler, Vol. iv., page 206." Barrett MS. Miscells. Papers, No. 7.

[e] College Journal.

The lady of his choice, who figured largely at a later date in the history of the College of Physicians, was Mary daughter of Colonel John Jephson, third son of Sir John Jephson, of Mallow, and of Bridget, daughter of Richard Boyle, Archbishop of Tuam, and sister of Michael Boyle, Archbishop of Armagh. Mrs. Dun's eldest brother, William Jephson, was Dean of Lismore; her second brother, Michael, became Dean of St. Patrick's, Dublin; her third brother was named John; she herself was the fourth child of her parents; the fifth was a sister, Elizabeth, who married—firstly, William Becket, Esq.; and secondly, Sir John Topham, Knight; and the sixth was also a sister, Katherine, who was wife of Colonel William Richardson, of Rich Hill, in Armagh.

Patrick Dun and Mary Jephson had issue one son, Boyle, who was baptised on the 24th of November, 1697, and who died young. The exact date of his decease I have not been able to ascertain. The fact that Dun had a child at all seems to have escaped notice hitherto.

I am indebted to the great kindness of Sir Bernard Burke for the following documents, about which he took great trouble; and, I may here express my thanks for his invariable and courteous attention to any request having for its object the advancement of medical literature. He gave me the fullest means of gaining all the information at his disposal. Appended to one of these documents are the arms of Dun, and also those of his father. The difference between them is a heraldic curiosity; and, as I lately inspected Dun's will at the offices of the Probate Court, I can vouch for the fact of the difference above referred to. The accompanying woodcuts were executed by Mr. Oldham.

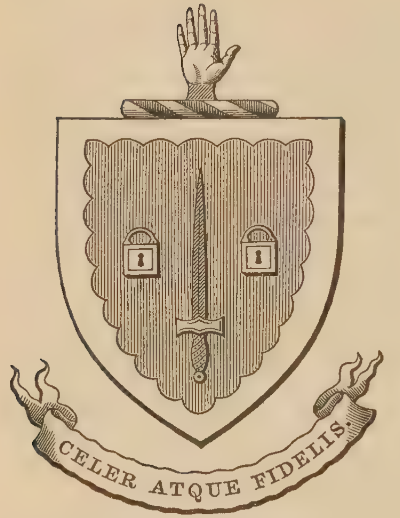
ULSTER'S OFFICE, 28*th July*, 1866.

Sir Patrick Dunn, of Dublin, Knt., Will dat. 16th November, 1711, proved, 1713. He left his estate to establish a Professor of Physick in the College of Physicians of Dublin. Died, 24 May, 1713. Buried, 27 in St. Michan's, Dublin.

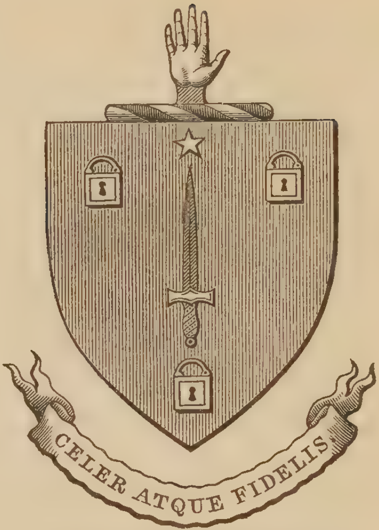
Mary, daur. of John Jephson, by Bridget Boyle, his wife, married 11th December, 1694; died 19 Jan., 1748, æt. 95; and was buried with her husbd.

Boyle Dunn,
Bapt. 24 Nov., 1697.
Died young.

J. BERNARD BURKE,
Ulster.


CELER ATQUE FIDELIS.

Arms on the Will of Sir Patrick Dun, of Dublin.


CELER ATQUE FIDELIS.

Arms Registered in Ulster's Office to Charles Dun, of Aberdeen.

From the Seal still visible on Sir Patrick Dun's Will in the Court of Probate, Dublin, it appears that Sir Patrick bore for *Crest* "the Dexter Hand" simply; but Nisbet's Scottish Heraldry, a work of great authority, gives for the Arms of Dun, the Sword and the Padlocks; for *Crest*, "a Dexter Hand *holding a Key Ppr.*," with "Mecum habita" for motto. This latter Crest has long been in use on the Seal Stamp in Dun's Library. Possibly Sir Patrick may have used both Crests. Certain it is the Crest of a Dexter Hand (without the Key) is registered in Ulster's Office to Charles Dun of Aberdeen, the father of Sir Patrick.

It has already appeared that Dun was engaged in every important transaction concerning the College of Physicians. In "Sir P. Dun's Book," p. 74, is a copy of two curious documents, to one of which his name is signed. It gives some clue to the professional position of the College in 1695, to Dun's position in that body, and to the mode in which vexed questions in matrimonial causes were then conducted. It consists of a commission from Archbishop Narcissus Marsh[a] to the College, to examine and report on the condition of one Hugh Geoghegan, in respect of a case then pending in the Metropolitan Consistorial Court. It also contains the report of the College. For obvious reasons I give both documents in the original Latin:—

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[a] Born in Wiltshire, in 1638; Principal of St. Alban's Hall, Oxon., 1673; Provost T.C.D., 1678; Bishop of Leighlin and Ferns, 1683; translated thence to Cashel, 1690; thence to Dublin, 1694; and finally to Armagh in 1702. He died 2nd Nov., 1713, ætat. 76; and was buried in the churchyard of St. Patrick's Cathedral, Dublin, adjoining the library which he built and endowed, and which is known by his name to the present day. His monument is now in the Cathedral. See his life and writings in "Harris's Ware."

ARCHBISHOP NARCISSUS MARSH'S COMMISSION TO THE COLLEGE OF PHYSICIANS, IN RE GEOGHEGAN.

NARCISSUS providentia Divina Dubliniensis Archiepiscopus Hiberniæque Primas et Metropolitanus. Dilectis nobis in Christo Honorabili et egregio viro Radulpho Howard præsidi, et Sociis Collegii Regis et Reginæ Medicorum Dublin in Hibernia SALUTEM in Domino sempiternam QUUM honorabilis et egregius vir JOHANNES TOPHAM miles Legum Dr. vicarius in Spiritualibus generalis Curiæque Consistoralis Metropoliticæ Dublin officialis principalis legitime fultus, rite et legitime procedens in quadam causa nullitatis matrimonii inter Claram Hussey alias Geoghegan reputatam partem actricem seu querelantem ex una, et Hugonem Geoghegan reum seu querelantum partibus ex altera ratione frigiditatis seu impotentiæ prefati Hugonis ad Coitum, varios actus expedivit usque ad informationem in eadem causa, Nos ad plenius cognoscendum et probandum dictam frigiditatem seu impotentiam prefati Hugonis ad Coitum, Corpus seu membrum virile ejusdem Medicorum Judicio inspiciendum scrutandum si sic lubet parti prefati Hugonis, modo et forma infra scriptis indulsimus VOBIS igitur in ea parte scribendum fore ad petitionem procuratoris prefati Hugonis decrevimus (Justitia mediante) SCIATIS igitur quod nos de vestra fidelitate, Circumspectione et Judicio in arte quam profitemini plurimum in Domino confidentes, vobis vel aliquibus quinque vestrum plenam potestatem et auctoritatem damus concedimus, et committimus, ad Corpus membrumque virile prefati Hugonis inspiciendum scrutandum necnon super Interrogatoriis omnibus que aliis viis mediis ac modis seu Circumstantiis quibus melius scire poteritis de frigiditate seu Impotentia prefati Hugonis ad Coitum examinandum congruis et opportunis loco et tempore, per vos vel aliquos quinque vestrum elegendis, et assignamus prefatum Hugonem ad se Corpusque ac membrum suum virile amandandum exponendum coram vobis vel aliquibus quinque vestrum ad subeundum scrutinium inspectionem et examinationem predictam et insuper rogamus quod circa omnia et premissa singula vos vel aliqui quinque vestrum intendatis et ea faciatis et exequamini indilatè cum effectu ita quod quicquid in premissis vos vel aliqui quinque vestrum feceritis nobis aliove Judici dictæ Curiæ Consistorialis Metropoliticæ Dublin. predictæ cuicunque in hac parte competenti immediate post executionem presentium debite certificetis clausim et authentice sigillatorum, una cum presentibus Datum undecimo die mensis Januarii 1695.

REPLY OF THE COLLEGE TO THE FOREGOING COMMISSION.

Reverendissimo in Christo Pater, Nos quorum nomina infra scripta sunt; Præses et Socii Collegii Medicorum Regis et Reginæ in Hibernia, literis vestris undecimo die Januarii 1695 ad nos datis fideliter obsequentes; Hugonem Geoghegan examinavimus, et ejus partes Generationi inser-

vientes inspeximus, ut nobis innotesceret, num ad Coitum Potens, vel ad actus venereos exercendos plane Inhabilis esset Sed cum ad pleniorem rei certitudinem necessarium duximus ut accuratiori scrutinio sese subjiceret, ac ut magis fida sed honesta suæ virilitatis judicia nobis palam faceret; Prædictus Hugo Geoghegan plane renuit, et vel non Potuit, vel noluit a nobis satis casta requisita peragere: adeo ut Mandatis vestris plene satisfacere hac in re non licuit. nihilominus examen hoc nostrum licet mancum Reverentiæ vestræ notum facere tanquam debiti nostri officii testimonium volebamus. Datum 20 Februarii 1695.

Rad. Howard, Præs.
Pat. Dun, Censor.
J. Madden, Censor.
D. Cumyng.
Tho. Molyneux.

DUN'S KNIGHTHOOD, &c.

On the 29th of January, 1696, Dr. Dun was knighted by Charles, Earl of Mountrath, and Henry, Earl of Drogheda, Lords Justices; and the next fact which I can find regarding him is, that, having in 1704 represented that there was an hospital in Dublin for the sick and infirm of the army, and that no physician had been appointed to attend them since the death of Queen Anne, he was appointed on the 25th of March, 1705, "Physician General of the Army," with a salary of ten shillings per diem.[a]

He appears to have been a regular attendant at the College meetings to the last; he was engaged in all its public, and in its more important private transactions throughout; as already noted, he filled its principal offices many times, and, according to the testimony of the College journals, he discharged all his duties to that body with industrious and energetic fidelity.

His son Boyle being probably dead, he made his celebrated will, and his equally celebrated deed concerning a professor of physic, in 1711. I give the *ipsissima verba* of both documents.

THE WILL.[b]

"Sr. Patrick Dun's Last will and Testament.

"In the Name of God Amen The sixteenth Day of November and in the Year of our Lord God one thousand seven hundred and eleven and in the tenth year of the Reign of our Sovering Lady Queen Anne I

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[a] Dr. A. Smith—Letter to Dr. Geo. Alex. Kennedy, in "Kennedy's Index to the College Journals.."

[b] This Will, and the Deed which follows it, are copied from "Sir P. Dun's Book," a MS. in the archives of the Coll. of Phys., and described in my Memoir of Dr. Stearne. I may here thank Mr. Fennell, of Dun's Library, for making accurate copies of these documents, and of several others, for the purposes of this memoir.

Sr. Patrick Dun Knight being somewhat indisposed in Body but of Good and perfect memory (thanks be to Almighty God) Do make this my Last Will and testament in manner and form Following that is to say,

"First I resigne my Soul into the hands of my Creator from whom I received it, in full hope of eternall Salvation thro: the merits of my Lord and Savour Jesus Christ and I desire my Body may be privately Interred without any Publick Noise or Ostentation in a Vault Adjoyning to the South West wall in the Inside of the Parish Church of new St. Michans in Dublin, which Vault I purchas'd from the Minister and Church Wardens of the sd. Church for me and my heirs for ever, by Deed Indented and duly perfected by them, Wherein is a Clause Excluding any Person from being buried therein without leave first obtained from me my Heirs, or Assigns.

"And as to my Worldly Estate I will that all my Debts which I may owe at the time of my Death, be Justly Paid within a reasonable time.

"And Whereas by Articles of Agreement made upon my Intermarriage with my now Dear Wife bearing date the tenth day of December one thousand Six hundred Ninety and Four, and made or mentioned to be made by me of the first part, my Sd. Wife and Bridget Jepson her Mother of the second part, and Sr. John Topham of the City of Dublin Knight, Francis Cuffe of the same Esqr. William then Lord Bishop of Derry and now Lord Arch-Bishop of Dublin, and Robert King of the City of Dublin Gent: of the third part: they my Sd. Wife and her Sd. Mother, did grant and Assigne over the sum of Nine hundred Pounds ster: in ready Money and Money out at Interest on severll. Security's Therein particularly mentioned being the Marriage Portion of the Sd. Mary unto the Sd. Sr. John Topham and other the Sd. Trustees in the Sd. Articles Mentioned, and I did also thereby Assigne over the sum of two thousand pounds Ster: in Money out at Interest on Severll. securitys therein particularly Mentioned and in ready money unto the Sd. Trustees both wch. Sd. Sums making together two thousand Nine hundred pounds, were so Assigned in trust that the Sd. Sr. John Topham and the other trustees should as soon as conveniently they could lay out the same in the purchase of Lands and Tenements to be settled on me for my life, and after my Death to my wife for her life for her Joynture, in case I should have no Issue by her living at my Death, in full Satisfaction of all Dower and thirds, she might claim with remainders to our Issue Male, and for want of Such to our Issue female, and for want of such Issue to my own right heirs, and in trust that untill such a Purchase Could be had the ready money should be laid out at Interest, And that the money that was then out at Interest should be continued out at Interest, or as the same should be paid in, it should be again put out to Interest in the Name of the Sd. Trustees to the intent and in trust that I should Receive the Interest during my life, and in case I should Die without having Issue by my Sd. wife living at my Death then my Wife should have the Interest thereof for her life, and in case of my having Issue living by her at my Death, then she to have two thirds, and the other third to goe to such Issue, and after her Death the Interest of the Sd. whole sum to goe to our Issue and for want of such Issue to my Execrs. Admrs. and Assigns, as by the Sd. Articles among other things therein contained may more fully and at large appear.

"AND WHEREAS that part of the Sd. two thousand nine hundred pounds which Consisted of ready money was put into or continued in my hands, and all the Sevrll. Sums of money which are Mentioned in the Said Articles to have been then out at Interest have been since paid in unto me or become desperate Except the sum of one hundred pounds therein mentioned to be due from Mr. Arthur Emerson and Mr. Anthony Percy.

"AND WHEREAS no real Estate was purchased by the Said Trustees in pursuance of the Sd. recited Articles and whereas I have by the approbation and consent of my said Wife, and of his Grace the now Lord Arch-Bishop of Dublin and of the Sd. Mr. Robert King the then surviving Trustees Mentioned in the Sd. Articles lent unto Gerard Fitzgerald of Rathroane in the County of Meath Esqr. the sum of Eight hundred pounds Ster. Principal money which I paid unto Stephen Ludlow Esqr. who had a Mortagage from the said Gerard Fitzgerald for the Sd. Sum, for Security of which Sd. sum of Eight hundred pounds, the Sd. Stephen Ludlow and the said Gerald Fitzgerald have by deeds of Lease and release dated the Eighth and ninth Days of June one thousand Seven hundred and five Mortgaged to me the town and Lands of Edmondstown als. Bally Edmond Moyle Aghadowe and of severall other Towns and Lands lying and being in the County of Meath, Westmeath and Cavan therein particularly mentioned, as by the Said Deeds may among other things more fully & at large appr.

"AND WHEREAS I have Likewise by the Approbation and consent of my Sd. Wife and of the Sd. Surviving Trustees laid out at Interest the sum of two thousand pounds Ster. upon a Mortgage made to me for the Sd. sum and the Interest thereof by Nicholas Colethirst of Ballyaly in the County of Cork Esqr. and Elizabeth Bromby his Mother by Deeds of Lease and release dated the Sixth & Seventh Days of February one thousand seven hundred and Eight, of the Town and Lands of Magulleen Ballyshoneen Knocknemara and sevll. other Lands therein particularly Mentioned Lying and being in the County of Cork

"Now my Will is and I do devise that the Sd. Sevll. Sums of money by me lent on the Sd. Securities shall be Deemed and looked upon as put out at Interest in pursuance of the said Marriage Articles and that my Sd. Wife shall have and receive the Interest of the Sd. Sevll. Sums of Eight hundred pounds lent to the Sd. Fitzgerald herein before mentioned and of the two thousand pounds lent the Said Mr. Colethirst and Mrs Bromby wch. shall grow due from the time of my Death for and during her life, the same together with the Interest of the Sd. Sum of one hundred pounds particularly mentioned in the Sd. Articles to be due from the Sd. Mr Emerson and Mr Percy and which hath not been paid in, to be in full satisfaction and Accomplishment of the Sd. Articles and in full satisfaction and Barr of all Dower and thirds which my Sd. wife can or may Claim in, to or out of my Real and Personal Estate.

"Item, I will and desire my Overseers to take a just and faithfull Account of all money left by me either in my own or wifes Custody, or in the Hands of any Banker, and of all and every sum and sums of Money yt. shall or may belong to me at the time of my Death, and also take a faithfull account of All arrears of Rent and arrears of Interest money wch. shall be then Due.

"And I do give full power to my Overseers, with the approbation of my wife to receive in all such sums of money as are already put out at Interest and shall be tendered to be paid in, and to make sufficient discharges for the same, and to lett out again all such sums of money and to put out all money that shall be had in our Custody or in the hands of any Banker to Interest on sufficient security's in the Names of my Overseers and the survivors or survivor of them his Execrs. Admrs. Without any hazard or damage to attend them in so doing and that all the Deeds and Bonds taken for securities of the Sd Sums of money do remain in the hands of my Overseers, my wife having Copies of the Same.

"Item, I bequeath to my Said Wife the Clear Rents and Profits of all my Real Estate together with the Interest of all such money as I shall have out at Interest at my Death or shall be put out at Interest by my Overseers pursuant to this will (over and above what is intended for her joynture) to her own proper use whilst she Continues my Widdow and no longer she paying the reserved Yearly Rent of my real Estate and performing all such other Conditions as I am Obliged to do for the same, and she being at all the necessary charges for the preservation of my Just Right and Title to the same and to the Money so out at Interest to every part and parcel thereof.

"Item, I give my Sd. Wife whilst she Continues my widdow the use of my Dwelling House on the Inns, Provided she keep it in good repair and pays the Rents and performs all the Covenants and Conditions which I am obliged to do by my Lease always excepting and reserving out of this Bequest one Convenient Room in the Sd. Dwelling House to be particularly set apart by my Wife with the approbation of my Overseers for the preservation of my Books.

"And I give my Exrs. by the Consent of my Overseers and the Survivors or Survivor of them power on the Determination of any of the Leases of the aforesaid Fee-farms to lett them out on Lease again, at the best improved Rents that can be had for them for twenty-one Years in

Possession but not in reversion, on this Condition that if any Fine be taken then the Lease or Leases so made shall be Utterly Void; The Lease or Leases so made to be always in the Name of my Exrs. and the survivor of them with consent as aforesaid And the Sd. Indentures of Leases or Lease to remain in the custody of my overseers, my Wife having a Copy of the same.

"Item, I give to my Sd. Wife to her own proper use a purse of Gold and all such other pieces of Gold and Silver and other Medalls which She Shall on her word affirm I Presented her with by way of gift since our Intermarriage without being accountable to any person for the same.

"Item, I give my Sd. Wife all such Jewells and Rings as I presented to her either before or since our marriage.

"Item, I give my wife all my Household Stuff and Furniture Excepting my Books and Plate.

"Item, I give my wife the Lawfull use of all my Plate as long as she shall continue sole and unmarryed with a Liberty to alter the fashion thereof at her discretion provided always the same weight and Standard be preserved she first giving security to my other Exr. that the Sd. plate or the same weight and Standard shall be delivered to him on her Marrying again, and if she continue my Widdow at the time of her death, then I bequeath all such Plate as I shall have at my Death to her, her Exrs. Admrs. and Assigns.

"Item, I give my wife my Coaches and horses and all the Furniture and provisions belonging to them or laid in for them at the time of my death.

"Item, I give my Wife all such Books as she shall say on her word were her own before our Marriage, or were bought by her Since Marriage, or were presented to her by me or any other Person since our Marriage.

"Item, I give my Wife such Fire Arms as she shall Judge Convenient for the preserving her House or for her Servants to travile with, the residue I give to Dr. Patrick Mitchell, together with all such Mathematical Instruments and other curiosities as are in my Closets, or used to be kept there, excepting my Books.

"Item, I give and bequeath to Patrick Dunn, of Tardy,[a] near Aberdeen, in North Brittain, Esqr. one Thousand pounds Ster. part of the Sd. Two Thousand pounds lent to Mr. Colethirst and Mrs. Bromby to be paid him after the Decease of my Dear Wife.

"Item, I Leave three hundred and thirty three Pounds Six Shillings and

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[a] Son of one of the nephews of the Principal of Marischal College, mentioned in his deed already quoted. That family is now extinct in the male line; Archdeacon Bisset, of Lissendrum (I believe), claims to represent it in the female line through Annie Dun, great-niece of the Principal, who married his ancestor, Robert Bisset, about 1724.

Eight pence to and among the Children of my Eldest Sister Katherine[a] Deceased.

"ITEM, I leave three hundred thirty three pounds Six Shillings and eight pence to the Children of my third sister Bessy[b] who is also Deceased.

"ITEM, I leave Four hundred thirty three pounds Six Shillings and Eight pence to my sister Rachell,[c] if Living at the time of my Decease, and if not, then I leave the Sd. Sum of Four hundred thirty-three pounds Six Shillings and Eight pence to her Children all the Sd. Severall sums devised to my Said Sisters Children, and my Sd. Sister if Living, to be paid after the Death of my Sd. Wife.

"ITEM, I devise all the Remains of my Real and personal Estate not above disposed of viz. my Fee farms and Real Estate after the Determination of the devise to my wife, during her widdowhood, and all my personal Estate after discharging and fullfilling the Legacys and devises herein before mentioned unto the Sd. Patrick Dun of Tardy Esqr. and unto the said Doctor Patrick Mitchell their Heirs, Exrs. Admrs. respectively to the use of and in trust for themselves their Heirs Exrs. Admrs. respectively untill there shall be a Professor of Physick Established in the Colledge of Physicians in Dublin to Continue for ever by Succession according to the Rules and Directions and under the Regulations by me laid down or to be laid down and expressed in a certain Instrument in writing under my hand and Seal Intituled, The Scheme which I intend to have observed for the Establishing a Professor of Physick in the College of Physitians in Dublin and from and after Such time as such Professor shall be accordingly Established. Then in trust that the Said Patrick Dun of Tardy and Patrick Mitchell and the Survivor of them and his Heirs and Assigns shall by such Conveyances and Methods as shall be reasonably desired by the Council of the Sd. Colledge of Physitians convey and assure or secure the Sd. residue of my Sd. Reall and personall Estate so to them devised, to answer and fulfill my intentions Expressed in the Sd. Paper Intituled, The Scheme which I intend to have observed for the Establishing a Professor of Physick in the Colledge of Physitians in Dublin, be it by Act of Parliament or otherwise howsoever.

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[a] Wife of Thomas Mitchell, mentioned in the Deed. He was father of Patrick Mitchell, M.D., one of the Trustees to the Will, and a Fellow of the College of Physicians. His election is dated 1 May, 1704.

[b] Wife of Alexander Anderson, of Bourtie. Their son Patrick had a daughter, Mary, who was second wife to Provost William Young, of Aberdeen. Numerous descendants of this marriage are in existence; among them may be noted:—John Leith Ross, of Arnage in Aberdeenshire; Patrick Black, M.D., Physician to St. Bartholomew's Hospital, London; and John Abercrombie, M.D., Physician to the General Hospital, Cheltenham. Patrick Dun, of Tarty, and [Sir] Patrick were godfathers to Bessie Dun's son, Patrick, in 1693. A full account of all these descendants of Bessie Dun is contained in the private memoir of Young already quoted.

[c] Wife of James Moire, of Ferrie Hill, near Aberdeen. None of these three sisters is included in the baptismal register of the Duns already quoted. Probably they were the children of Charles Dun's first marriage, or were born after 1654, to which year only search was made.

"And I nominate and appoint my wife and the Sd. Dr. Patrick Mitchell Exrs. of this my last will and Testament.

"And Lastly I declare and appoint my good Friends the Sd. most Reverend Father in God William Lord Arch-bishop of Dublin and William Whitshed and Joseph Deans of Dublin Esqrs. or any two of them overseers of this my Last Will and Testament, and do revoke all former Wills by me made. In Witness whereof I the said Sr. Patrick Dun have subscribed this my Last Will and Testament, with my own hand and thereto put my Seale the Day and Year first before written.

"Patrick Dun.

"Signed sealed and published in the presence of these Witnesses who also subscribed their Names as Witnesses in the presence of the Said Sr. Patrick Dun—Edward Makay, Will: Sumner, Tho: Cooke. Not: Pub:"

This will was proved 24 June, 1713.

THE DEED.

"SR. PATRICK DUN'S DEED FOR CONSTITUTING AND PROVIDEING FOR A "PROFESSOR OF PHYSICK.

"Whereas in my last will I have hinted or signified That I had left it to his Grace Dr. William King present Arch-Bishop of Dublin and to my Dear wife Mary alias Jephson, to conceive and contrive a Deed for settleing and disposing of such Interest as may remain in me (after the Death of my Dear Wife) of my dwelling House in the Inns in Oxmantown Dublin and my Interest in two fee Farms in the Barony of Upperthird in the County of Waterford in Ireland I declare that it is my desire and intention to make provisions for one or two Professors of Physick to read public Lectures and make publick Anatomical dissections of the several parts of human Body's or Body's of other Animals, to read Lectures of Osteology Bandage and Operations of Chirurgery to read Botanic Lectures, Demonstrate Plants publickly and to read publick Lectures on Materia Medica, for the Instruction of Students of Physick Surgery and Pharmacy And if the Society of the Inns would Consent to grant the reversion of my House after the Expiration of my lease from them for a Physic School and habitation for the foresaid Professor he being oblig'd to keep the same in good and sufficient repair or Liable to have the Rents of the Feefarms or part thereof Sequester'd for the reparation of the same by the Guardians of the same hereafter Named I am willing to give my Title and Interest in my said House after the Death of my Dear Wife for the Said use and also for an Hall or Place for the King and Queens College of Physitians to assemble and hold therein, They Contributing according to their accommodation towards the repair of the Same. And provided that the aforesaid Professor or Professors be elected Fellow or Fellows of the Said College of Physitians in the first Vacancy that shall happen after his or their Election to the Professors Place, and Provided that the Sd. College Physicians give no unnecessary disturbance or hindrance to the peaceable dwelling of the professor or professors in the Sd. House. Likewise I would give my Books for the Lawfull use of the Sd. Professors and College of Physitians, Provided the Sd. Professor or Professors Inhabiting the Sd. House immediately after their Election and before they have Possession given them of the House by the Guardians, give Bond and security to keep and preserve the Sd. Library and all and every Book and Books in it, and if any should be lost or wanting, to pay for or purchase another of the same kind, the same paper and Edition or better in the room thereof. One of the Guardians to be his Grace the present Arch-Bishop of Dublin during his pleasure or Natural life, and after him such other person as he may be pleased to nominate, by writing under his hand and seal for that purpose before his Death without affixing or Appropriating that place to the Arch-Bishop of Dublin (if His Grace shall so think it expedient) for the time being the Present Lord Blessington and the Heirs Males of his Body lawfully Begotten.

"My Cousin-german Patrick Dun of Taertie in Scotland Near Aberdeen, and the Heirs of his body lawfully begotten The Heirs Males Lawfully begotten upon my three sisters by the late Tho. Mitchell The deceased James Moire of Ferrie-hill and by Alexander Anderson of Bourchie the Heirs Males of John Jepson Esqr. my Wifes Nephew the Heirs Males of Brother Will. Jepson and of her Brother Dean Reader lawfully begotten upon her sister Elisia.

"The Examinators to be the Provest for the time being of Trinity Coll: The Professors of Physick in the same the Presidt. for the time being of the King and Queens College of Physicians in Ireland the two Eldest Censors Yearly Chosen by the Sd. College The Arch-Bishop or any other Person may examine, but the forenamed Examinators to be first duly Sworn or to take a voluntary Oath to Examine faithfully without favour affection or prejudice to any Candidate and to deliver their oppinion of such person as they shall Judge Qualified.

"That upon a Vacancy Publick Advertisemt. may be Printed and Published either in the London Gazat or otherwise giving Notice that such a place is Vacant, in Dublin, That all persons qualified may be admitted to Stand Candidates for the same.

"THAT such person as shall be declared and found best qualified shall be declared professor and invested in with the same by the forementioned Guardians. If Qualified I desire the preference may be given to those descended Lineally from my Cousin-Germain Patrick Dun attested by Certificate under the hands of the Provest Baily and Council of Aberdeen in Scotland and the Ministers of Aberdeen for the time being Next the preference to be given to those descended Lawfully from my first, second and third Sisters, attested in the like manner. Next to those descended of John Jepson Dean Willm. Jepson, my wifes Sister by Dean Reader and of the Rt. Honble. the Lord Blessington and after to the best qualified without any Exception.

"THAT for salary they may receive the Rents due to me out of the Fee-farms of Temple-sonak and Currogh-bolintea The Leases to be renewed at the best improved Rent without taking any fine Gratuity or Present for the Same and if any such thing can be proved the Lease to be Voide.

"THEY yield at Present £58 Ster.

"TEMPLESONAK is Let by the present Tenant at 72 lb. Yearly profit over and above all Rent to the D. of Ormond or to me. If the Leases were out they may be both Set at 200 lb. ℔ Ann. Clear Profit to those holding under me. Please if this may be a Competent Maintainance for two Professors or only for one.

"Sign'd at Dublin this Eight Day of June 1704 by me

"PAT. DUN. Seal.

"Pat: Mitchell
"Jon. Broadstead
"Danll. Gillispick."

This was enclosed in a paper sealed up and directed (in Sir Pat. Dun's handwriting) to His Grace the Archbishop of Dublin, and Mary Lady Dun.

So far as I am aware these important documents have never yet been printed in full; though it appears on the College Journal, under date 23 April, 1741, that 500 copies of both were then ordered to be printed; and the late Professor Osborne,[a] in his Annals of Sir P. Dun's Hospital, published a great part, but not the whole of this will.

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[a] Jonathan Osborne, M.B., Dubl., 1818; M.D. 1837; sometime Pres., V.P., Censor, and Registrar of the College of Physicians. He vacated his Fellowship on election to the King's Professorships of Materia Medica and Pharmacy, and was chosen an Hon. Fell. in 1840. He was Physician to Mercer's Hospital, and published many medical essays, some of which are very curious and learned. He died 22nd January, 1864, and was buried in a vault under St. Michan's Church, where (by his own desire) his coffin stands in an upright position. He was an elegant scholar, particularly in the Greek language. For his life and writings see Dub. Quart. Journ. of Med. Sci., Feb., 1864.

Dun's friend, the Reverend Mr. King, was now Archbishop of Dublin; and the last letter of his which I have been able to obtain is written to that prelate as follows:—

"Tewsday 30 Septr. 1712.

"Maye it please your Grace

"I am sorry to heare that your Grace hath brought ye gout to toun with you, I praye God that it maye be ane easy and short fitt, I humbly thank your Grace for your paper which is here inclosed I got Mr. Cook to draw a Coppy in wide lines I delivred it to Sr. Richard Levings, Yesterdaye he sent me notis by a Messager that he would send me my papers in a day or two, My wife and others wer with me at the time, therefore I have writ to Lady Leving, if any papers be sent from Sr. Richard to me, that theye maye not be sent to my house but that all and Every paper maye be sent to your Grace I praye your Grace to open and read Sr. Richard's letter to me and to peruse the draught of the settlement, and to keep them by you, till it please God that we maye meet conveniently about them company is coming.

"I must Conclude that I am

"Your Grace's most devoted and faithful servant

"PA. DUN.

"If the Messager that came from the Countrey come with the papers the inclosed piece of money is for ane acknowledgement of his trouble but if the be sent by any other they will need no gratuity but as your Grace pleaseth.

"To his Grace the Lord Archbishop of Dublin
"At St. Pulchers."

HIS DEATH AND BURIAL, &c.

On the 20th of April, 1713, he attended a college meeting for the last time; he died on the 24th of May following, and on the 27th he was buried under St. Michan's Church, as directed in his will. Shortly after Sir Patrick's death Lady Dun addressed the following letters to Archbishop King:—

"June ye 6th, 1713.

"My good Ld.,—Could I conseall wt. has put mee into a miserable condition, out of regard to yu I would doe soe because I know in some measure yu. will greve for one of ye best of men that has bin yr. Long friend, & I am sure yr. Grace will know by barely Loosing such a man yt. I was above eighteen years a wife too and one hee valued & yt. valued him my present state is very deplorable, ye suddennes of my Change & all ye aggravations I have already known hapning to one in an ill state of health makes itt sink soe deep & Lye soe heavy on my spirits yt. unless God yt, orders all things very particularly shews his power in supporting mee I shall not bee Long miserable, for though my reason cannot bear mee up in tryalls of ys. Life yet my Dependance on God Lets mee hope for a better, I know not wt. to say to yr. Grace I am in ye Depth of trouble, & thinke venting my self relief, I know yu. will pitty mee & I beg yu. will pray for mee, all ye hopes I have if I Live yt. I shall find yu. are trusted wth. my affairs wch. I know nothing off, I fancy my self a criminal yt. has forfeited all right to humanyty, and to every thing yt. was my own wn. I see all my house and goods Lockd up as tho. I had forfeited ym. or would steall ym., I have acted wth. Honour & while I Live will endeavour to soe in regard to his memory yt. while hee followed his own inclinations never in ye Least circumstance acted otherwise but people of principall may not suspect & see through ill designs, I have writt. a Long Letter to Lady Blessinton part of wch. I beeleive shee will acquaint yu. wth., my sad story is so cuting I would not repeat itt if I could avoid itt, I have resigned a hopefull Child[a] my all in wch. I saw many misfortunes to mee and greived then for wt. I now & ever shall feell, & I have parted wth. ye best of husbands and one of ye most sincerely Just men yt. ever breathed & if instead of a Child I meet an enemy for his heir sure tis not a tryall will goe neerer to me then their Loss, I hope if I live to make a right use of itt, & see there is nothing in ys. world to make one happy since ye very actors of itt are Liable to mistakes and some of ym. soe ill as to tire ones being among them, I should bee glad to hear yr. Grace recovered yr. health wch. yt. yu. may doe & act wth. yr. former courage in all difficulties, Live Long to bee a blessing to ye world is ye hearty & constant prayer of one yt. begs yr. direction & shall doe in every action of my Life nothing hapning yt. alters my respect & value for yr. Grace but in all conditions I shall bee yr. Graces faithfull obliged

"& very humble servt.

"M. Dun.

"ingage some good men to befriend mee if they can on yr. acompt & his yt. is gon, I have noe merit but yt. I was ye only person hee was obliged to take care off, & is ye sufferer for his Loss.

"ffor ye Most Revnd. his Grace ye
"Ld. Arch-Bishop of Dublin
"att Bath."

"June ye 23d 1713.

"My very good Ld.—Your absence is a very sensible addition to ye great greife I am in for ye Loss of a good husband whose virtues I soe truly valued that I thought my self very happy in a married state, & never thought enough of the condition I am come too, in wch. I have yet mett wth. noe sattisfaction but yr. Graces Letter of ye 19th wch. I this day received, by wch. I see I am not disapointed in every thing but yt. yu. are ye person nothing could alter my opinion off since I had opertunity & reason to Judge, many friends wth. yr. Graces quallifications I must not expect to meet, & but few such as yr. Grace & I have Lost I fear are Left, I am convinced yu. soe perfectly knew one anothers virtues yt. yr. friendships were sincere & if yu. are pleased to continue a demonstration of itt now hee is gone I hope I yt. am his only remains on yt. acount may have a title to yr. favour & advice wch. I intirely depend on & beg for as yr. Grace shall find I will be guided by itt I writt to yr. Grace in ye Depth of sorrow & many resentments wch. I have noe abatement off but by kind carriage of many civill friends of my own wch. I really beeleive are ingaged by ye value they had for him yt. is gone, but my Ld. I depend on yr. Grace yt. has known my behaviour as a wife to yr. friend to Judge impartially for mee, & whether yu. thinke hee valued mee or gave mee any influence over him wt. use I have made of itt is very plain to ye world, I had ever my own death and another Life too much in view to be over anxious for this if I am not provided for as well as my friends and ye world expected, I desire itt might be imputed to my own carelesnes and his weakness (wch. others watched) & my Love to him made mee as blind too as he could bee himself, upon disapointments I have taken ye way to Lessen ym. yt. yr. Grace advises & shall bee more fixt in itt since I find yu. aprove of itt, when I have found my expectations have run higher then God thought fit to answer I have endeavoured to turn my thoughts immediately on ye much greater part of ye world yt. not only want my blessings but ye necessaries of Life & by considering ym. have found great reason to bee thankfull to him yt. only knows why and how wee come to differ, I own I ought not to doubt my beeing able to act wt. part he apoints mee, and I hope I shall endeavour itt, but when a change is made yt. I am afflicted by sure I may greive without repineing for tho I feell ye stroke yet I hope tis intended for my good and will not prove ye wound of an enemy, an ill state of health makes me sink under tryals & att this time I have yt. to strugle wth., ye old attack of pain in my face are very violent, The Will yr. Grace had has bin opend I was not soe inquisitive or hasty to know itt as ye follish behaviour of some made ye town to bee, What I have to bee consern'd att in Gest now tis known, is yt. hee who was master of soe much reason and Judgment whose active Life gave him noe time to Leave remains of his knowledge but wt. ye good hee has done must keep up by gratefull people, should Leave soe imperfect a work behind him on record as this Will hapens to bee, I always knew his intent was to establish something for ye incouragement of his profession wch. hee saw by abuses was runing into contempt. I beeleive hee intended his nephew should if alive have ye first benifit of itt, wch. was modest enough, & when wth. great difficulty I gott him to convers wth. this Nephew after yt. first ill step hee made into ye world, I fear hee talkt to him on this poynt, wt. use ye Nephew thought to make of ys. favour I am not willing to Judge, all men have their failings & by many actions I can conclude too much self is Dr. Mitchell's,[a] had hee acted fairly candidly & like a friend as I alway did by him hee had bin in a better condition yn. wt. hee is intended by ys. will, but hee thought hee had noe better game to play then to gett mee Lesend in my husbands essteem, hee had particular obligations to mee, & saw yt. I sett up for nothing as to my self but a comfortable subsistance during Life, & yt. att al times his uncle shewd a design of disposeing his fortune his own way wch. I never oposed nor in the Least desired to alienate any part of itt to my self. Tho I had noe Child, yet al this could not oblidge him to thinke I deserved to be used as his wife, my marrying his uncle was a crime he could never forgive, My Ld. my particular greivance as to this will is my beeing Joynt executor wth. this man had I bin Left out or any indifferent person named I should have bin sattisfied, but hee will not carry himself soe as to Let mee shew ye respect due to my husbands relation, till I see yu. I cannot tell all ye reasons I have against him, & to see him soe Little thankfull for wt. he had noe pretentions too, & grudge & dispute my right yt. brought a fortune credit & was noe ill wife to his uncle & was oblidged to run ye risque of his fortune will bee a great disturbance to mee, but my Ld. I hope by yr. beeing named an overseer itt will bee in yr. power to redress many of my greivances, this I please my self wth. I have never shewn a covetous temper, & I hope now there is soe Little Left mee I shall not forfeit my charactar if I now Lay hold of any advantage ye Law will give mee I should not reioyce yt. yr. Grace was to Judge for mee if I design'd or had any ill thing to effect, but I hope where I am press'd & things will bear a Just friendship yr. Grace will assist mee, had I thought yr. Grace soe ignorant of ye Will I would not have bin soe, Tho I could have trusted my spouses intent yet his weakness att ye time it was perfected has bin Laid hold on, however Just now Dr. Coghill has sworn Dr. Mitchell & I to itt, & I must tell yr. Grace I am in a much worss condition than ever yu. thought to see mee, I shall not know wt. to doe for want of yu., May yr. perfect health if I Live to see yu. return make amends for wt. I now suffer by yr. absence, I thinke my not goeing wth. yu. was a providence but beeing denyed anything by my Deare husband was very unusuall, I did not thinke I stayd to perform my Last offices as a tender nurss, I hope yr. Grace will Live Long & not know ye want of a phisition, of all people I would not have yu. my fellow sufferer, I have not words to express my my condition or ye respect I have for yr. Grace nothing can make mee otherwise then most faithfully my Ld.

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[a] Her son, Boyle, who died young.

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[a] Son of Dun's eldest sister Katherine (see note under the will).

"yr. very much oblidged & humble servt.
"M. Dun

"pardon my faults I am very full & can hardly Leave out & put together my thoughts within compass of a letter.

"ffor ye Most Revnd. his Grace ye Ld. Arch-Bp. of Dublin
"att ye Bath."

"June ye 27th 1713.

"My very good Ld.,—I writt soe Long a Letter to yu. this last week in answer to soe good a one from yr. Grace on ye. ocasion of my sad curcumstances yt. I fear yu. will wish yu. had not known mee when yu. see how much I trespass on yr. patience but my good Ld. give allowance to greif yt. is opressed by things yt. at another time would not affect or seem soe heavy, & be soe Charitable to forgive ye impertinence yt. may bee mixt wth. my great dependance on yu., my Deare husbands Will has bin read since I writ Last to yr. Grace, I find nothing could move him from an intire care & Love of mee, but by itt apears yt. hee has bin tempted to distrust mee, I have found him alter'd in his humour & way to mee for some time past but thought wth. age infirmities would come & twas my Duty to bear ym., and was so far from a Jealousie of Roguery yt. I endeavourd to have his Nephew come often to him because I found itt was agreeable to him, but my Ld. all I have suffer'd in ys. way & wt. I fear more his uncle's end was hastend by ye disquiet hee put his mind into, for after wholly trusting a wife for fourteen years wth. all hee had to be possesed wth. thoughts of her beeing false to her trust would affect any mind, I found him very often in unusuall heats, & doubts of mee, & now ye Roguery is fixt for Dr. Mitchell & his wife reports about yt. I intended Cheating him of five hundred pound yt. Mr. Dean Laid out for me in his name, Mr. Dean was an ill tooll to bee made a knave off but from end to end ye story is false, wch. I would aver were I this minute to apear before ye knower of thougts, I never had a thought yt. tended towards wronging him wch. I beelive yr. Grace or any yt. intimately knew his opinion & value for mee will beeleive because I might have influenced him to have done more for me than I could cheat him off, I hear Dr. Mitchell intends or hopes he may bring a bill against mee to force me to discover wt. money I have Laid out yt. I can sooner answer then I fear my demands will bee allowed, by ye Will hee gives mee all ye summs he had presented mee wth. had I had any design but to increase his fortune as fast as I could I might by those presents have bin very rich, but since those summs are all I am to Claim & hee thought hee had Left mee a great deall I hope wt. I will take on my Conscience to Demand will not bee denyed me, tis noe small trouble to mee to see yt. all hee has

Labourd for is goeing quite contrary to all his intents, but since tis soe I hope mine yt. is a Just Claim will not be denyed mee by trustees yt. is all ye comfort Left mee, yr. Grace Mr. Whitched and Mr. Dean or any two of yu. is to act, as yet my house is Lockt up, hee has orderd yt. all his ready money & arrears should be put out & I to have ye benefit of all above my mariage settlemt. dureing my Widowhood I beeleive yr. Grace did not thinke ys. Limitation would have bin thought of by him, yt. I should have all his plate but give security to return ye same weight to his other executors in case of marriage, his house on ye same terms, if I dye unmaried ye plate my own, I suppose he will insist on some security besides my own for ye plate, ye furniture my own wch. was all old before I had itt, ye horses & Coaches my own, I confess twas my fault I am not better in yt. particular for hee would have parted wth. these yt. are worn out & bought new but I desired to save all possible expence for this year, hee has orderd his Debts to bee paid & says noe more, I have noe money, & whether ye trustees will allow mee any till itt become next due I cannot tell, the term imploys Mr. Whitchet & Mr. Dean soe yt. they have not yet apointed a time to settle my affairs & to have ye money Lodged, if yr. Grace pleases to write to ym. wt. yu. know ye Dr. design'd not to Lay mee of all consernd in his Will under hardships & esspecially by those he never intended any benefitt too I beeleive they will be more inclined to favour mee where Justice will allow ym., & ye other gentleman will be ashamed of not beeing contented wth. wt. he has gott by pure ill art. I am soe very ill yt. I must gett out of town, and I am not yet resolved whether I will goe to ye Country Just for an amusement or go to ye Bath where I may hope for a more effectuall cure for ye disorders I find in my face head and indeed all over mee I beeleive all ye Juces of my body are sowerd & indeed I have hardly a thought yt. is not to that degree soe yt. I am afraid I shall not bee as much Mr. of my self as I would when I consider ye relation hee bears to one I truly loved & was happy in but when yt. ill instrument made mee other, I sadly want yr. Graces assistance on many acounts, but pray my Ld. write ye other overseers to make mee as easie as my case requires and will bear, & if I am not well & can get wherewithall to carry me I know not but ye Bath may bee ye place I shall try for my health ye next season, pray my Ld. forgive me for these sort of troubles tis ye greatest act of Charity yu. can doe to Let me communicate my thoughts to yu. I doe itt wth. yt. assurance of your Graces friendship yt. itt is a reall releife to mee in a condition yt. wants some comfort, may I have yt. of knowing yr. Grace Injoys Life & health as Long as I Live wch. is a Constant hearty prayer

" of yr. Graces poor afflicted & sincere humble servt.

" M. Dun.

" Pray my Ld. if yu. see fitt to write to ym. to take care how ye money is Lodged when taken out of my house for a great deall of itt is part of yt. mentioned to make good my mariage settlement yt. has bin paid in since this Will was made & all of itt is to bee aplyed for my use, while I am a widow, I fear there will be noe care taken to put itt out by ye other executor & soe my income will bee small.

"To ye Most Revnd. his Grace ye
"Ld. Arch-Bp. of Dublin att
"the Bath."

"July ye 2d, 1713.

"My very good Ld,—I beg yu. would accept of my hearty thanks for ye tenderness yu. express for mee in a sad condition and on an ocasion yt. I am sure if any yu. will allow I may greive, I would not have yr. Grace frighted att seeing my Leters for I really am troubled yt. I should appear anxious for ye things of a world I am not fond of Liveing in, but ye wise disposer of all things sees fitt to continue mee for reasons unknown to mee, I will endeavour all I can to bee ready for his Call, & in ye mean time since hee has put mee to act a part yt. wholly is comforted by ye promises hee has given of assisting & protecting ye widow, wth. my dependance on him I am glad I know soe good an instrument apointed as yr. Grace to apply too, I will say noe more of the value I have for yr. Grace to Lengthen this yn. to assure yu. my dependance on yr. friendship is as steady as I beeleive yr. desire of doeing good is & yt. I would not thinke for any advantage yt. yu. could bee other yu. wt. my Deare husband & I agreed in beeleiving yu. were in yr. self, & to us, I beelieve twas a providence to mee yt. I mett wth. ye shocks & Loads I did wn. my affliction was soe new, itt might have quite sunk my spirits had I not bin roused & made to know yt. my condition was different from wt. it was wn. my tryall was Less but my care of my self not soe necessary as now yt. I have noe one immediately to take care of mee.

"I have read my Deare husbands Will over since my thoughts were more calm, I mist att first two things hee ever voluntary promised, one yt. no body should disturb mee for a groat att his deathe & ye other yt. in case hee had noe Child hee would Leave mee more to dispose off then I brought him, these promises satisfied mee Tho. I thought if I should ask for more there was presedents off husbands doeing more where there was noe children & wives they valued, my Ld. ye promises hee made hee intend'd to make good, & where they faill tis by my default, for hee has devised mee as a Legacy all ye presents hee made mee & bid mee keep acount off, for many years I thought ym. too great for his fortune & did not while I had hopes of Children, keep ym. distinct or Book ym. for some years past I have Tho. I Let ym. Lye in his hands or bee placed wth. his money at his Bankers, I thought ym. att first hearing ye Will all sunk, but seeing how hee had declared his trust by his Legacy to mee I coppyed out his Words & made ye queries I heer send yr. Grace for ye sattisfaction of my overseers who I knew would & I desired should act soe as to please all, I hope they will all thinke ye words plain enough to imply something, ye gentlemen apointed wth. yr. Grace I take to bee Judges, soe I sent to Mr. Brodrick & to Mr. Bernard who has made ye same answer & in ye same words, I cannot bee half so rich as my husband intended, for I will not Challenge any thing but wt. my word will bee Justified by my Book, Tho. I am sure itt would please him to see Justice done to mee to whome hee would still have bin more kind had hee known how things have bin carryed, but whoever is gainer I will keep to ye principalls hee trusted & wch. made us both happy in one another, & wch. I find hee still beelieved in mee tho. for some time past hee has bin often made uneasie by attacks yt. has bin made to Lessen mee to him I found when he taxed me he was soon diverted & I was afraid to know ye authour of wt. I fear'd I could not forgive, but since his Death Dr. Mitchell & his wife has fixt itt on ymselves by saying to severall they would file a bill against mee to make mee discover ye money I Laid out in other peoples names wth. a design to Cheat him yt. never denyed to give mee any thing I ask'd, I pray God forgive ym. & keep me in Charity.

"if I Live to see yr. Grace return in health I am sure I shall be revived in a great measure yr. beeing heer would have bin of great use to mee & cleared many of ye Clouds I am under, I must again return my thanks for ye care yu. have taken of mee & ye great compassion yu. exspress for my affliction, may yr. Grace Live Long to bee a support to those yt. want itt & alway be a friend to ye poor remains of yr. old friend yt. is wth. all dutyfull respect

"Yr. Graces Most oblidged & faithfull humble servt.
"M. Dun.

"pray my Ld. if yu. would have mee consult any more Lawyers & thinke these things require itt let me know, I have severall demands, one constant present hee made mee was ye fees hees had from my own relations yt. were not single & they were all I have had from him of wt. fees, he gott, unless some odd times, I am sure I cannot demand ym. wth. ye pleasure hee gave ym. mee.

'To ye Most Revd. his Grace ye Ld. Arch-Bp.
"of Dublin att
"ye Bath.

"if yr. Grace pleases return mee ye inclosed."

DISPOSAL OF DUN'S PROPERTY.

It appears from the College journal that on the 26th of October, 1713, Lady Dun addressed a letter to the President and Fellows, inviting them to use the house of Sir P. Dun during her life, and, also, to take possession of his library. On the 18th of January, $17\frac{13}{14}$, the College recited Sir P. Dun's bequest of his house to them, and, in consequence of the invitation from his widow, took possession, and met there for the first time on the same day. In 1715 a charter was obtained, dated 14th October, in the second year of George II., incorporating the professorship agreeably to the rules laid down in Sir P. Dun's deed, and appointing perpetual successorship, under the title of "The King's Professorship of Physic in the City of Dublin." The first notice for electing this King's Professor appeared on 16th of March, 1716 (*Dublin Gazette*, 1717), and Dr. Robert Griffith was chosen to be the first Professor. The electors were, Benjamin Pratt, Provost, T.C.D.; Thomas Molyneux, Regius Professor of Physic; Richard Helsham, President of the College of Physicians; William Smyth and James Grattan, Senior Censors. Dr. Griffith died in 1719, and was succeeded by Dr. James Gratton. For some years after the death of Sir P. Dun, Lady Dun was on the best terms with the College; but before the death of Dr. Griffith they found it necessary to commence proceedings by filing a bill against her and her co-executor, Dr. Patrick Mitchell, with whom (as appears by the preceding letters) she was not on good terms, in order to compel them to execute the trust. Lady Dun's own feelings will be best described in the following letter to Archbishop King; the letter itself is a good comment on Dun's intentions regarding his medical bequests:—

"May ye 3d, 1716.

"May it please yr. Grace,—I am sorry to find yr. good intention of my husband (which wholly depends on yr. Grace's friendship to him and inclination to do good) in danger of being lost. I am sensible that all which has been done since his death is owing to yr. Grace, and that the settling a Professor was a trust Left in the body of Physitians to get done previous to the Sallary he intended and I think my Life gives them an opportunity to get a Professor chosen that might have a right to Claim after I am gone and be possesed of what will fall into hands Less in their Interest than I am, but since tis thought my husbands kind disposition to me is an obstruction to this good work, Tho. as there is no present Sallary: so there is no present business required from such a Professor, but that of a Law Sute which they apprehend will be some charge, I will out of regard to my husband and gratitude to his leaving me all, give some help towards the Sute, when the Professor is Chosen and prefers a Bill to make the trustees assign according to the directions in the Will. I will Let such Professor have as much of my House for his own dwelling as will save him the Rent of a small one and in case my House should be set at the time yt. Sute commences I will allow him at the rate of thirty pound a year till the House comes into my hands and I give him an apartmt. in it, at which time ye Colledge shall have the priviledge of meeting there, and in case such a professor should have a Large Family I will quitt the whole House he paying me twenty pound a year, and giving security for the Library of Books, this regard to my husbands intent I am incouraged to shew by yr. Graces assisting in it. I am sure all that receiv's benifit by the work must allow it a place among the many good ones that the publick owes to yr. Grace. this proposal of mine I trust your Grace with and I hope if it is Claimed on the account I have mentioned yr. Grace will not fear my going back from it, I am sure twould not be agreeable in a Letter to yr. Grace to reed the reasons I can give for my trusting all good works to yr. care I hope some that can express such things better will do you Justice and that yr. Grace will accept of my gratefull acknowledgements for yr. favours and believe me to be with all sincerity my Ld.

"Your Graces obliged and very humble servant,

"M. Dun.

"ye Ld. Arch-Bp. of Dublin."

The case was brought to a hearing in 1723, and a decree was obtained, in pursuance of which the estates bequeathed for the support of a professor were conveyed to Lady Dun during her widowhood, with remainder to the College in trust for the professor and his successors. Another decree of the Court of Chancery was obtained in 1733, on a rehearing of the case; and this directed that an account of the personal estate of Sir P. Dun should be taken by one of the masters. When this report was brought up Lady Dun took further exceptions, and instituted proceedings afresh. At length, in 1740, by consent of all parties, it was decreed that she should assign all securities mentioned in the master's report, and also give security by recognizance for the payment of £1,200 after her death to the College for the purposes of the trust.[a]

The bequest of Dun being now secured, and the college being of opinion that on the expiration of leases at Lady Dun's death the estate would rise in value, determined to enlarge the plan laid down in the deed by establishing professorships supplementary to the medical courses then taught in the university; and in 1743 obtained an act of Parliament[b] vacating the office of King's Professor on the death or resignation of Dr. Grattan; and directing the annual income previously applied to that purpose to be divided equally between three professors, who were to be styled the King's Professors of Physic; of Surgery and Midwifery; and of Pharmacy and Materia Medica. The candidates were to be examined by the Provost of T.C.D.; the Regius Professor of Physic; the President of the College of Physicians, and the two Senior Censors of the same. The college journals state that this bill passed on 18th January, 1741. In January, 1748, Lady Dun died, and was buried under St. Michan's Church, beside her husband.[a]

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[a] Osborne's Annals of Sir P. Dun's Hospital, p. 11. The College journals state that on the 18th of January, 1741, the president was served with an ejectment from the ground on which Dun's house stood.

[b] This act was never printed among the statutes of Parliament; and though frequently quoted as having passed in the 21st of Geo. II. (even in subsequent statutes, such as the 40 Geo. III., cap. 84,) it was enacted in the 15th of Geo. II., and is expressly stated to be a *public* act. I have read the original in the Record Office. It appears to have been privately printed, in 8vo, in 1747. See Dr. Perceval's "Account of the Bequest of Sir P. Dun," &c. Dublin, 1804. There is no printed copy extant, so far as I know.

Dr. Grattan, the second King's Professor, died in the same year; and on the 20th of May, 1749, the first notice for the election of Professors under the Act of Parliament appeared.[b]

The following were elected:—

Professor of Physic—Henry Quin, M.D., of Padua.

" Chirurgery and Midwifery—Nathaniel Barry, M.D., of Rheims.

" Pharmacy and Materia Medica—Constantine Barbor M.D., of Dublin.

On the 28th of November, 1752, each of the King's Professors was ordered to lecture thrice weekly in the Philosophy School, T.C.D.

Dr. Barbor died in 1783, and the estates at this time producing £926 per annum, the College of Physicians conceived that the School of Physic ought to be furnished with additional professorships, and provision should, be made for clinical instruction. The following notes, which I have taken from the Parliamentary papers at Dublin Castle, show the preliminary steps which eventuated in the passing of the Statute 25 Geo. III., cap. 42, in 1785:—

1783-4.—Committee of House of Commons appointed to enquire what may be the most effectual means of establishing a complete School of Physic in this kingdom (No. 1, Bundle 94, Com. Books). Monday, Dec. 1783—Rt. Hon. J. H. Hutchinson in the chair.

Dr. Cleghorn examined—Objected to then existing plan of School of Physic as incomplete—"Degrees not being founded by it." He also thought it not reputable that gentlemen should go abroad for degrees. Dr. Cullen said "that there is nothing mentioned in the will of Sir

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[a] "In Summer, 1843, the writer of this note, accomponied by a gentleman connected officially with Dun's Hospital, having been furnished with the requisite permission from the parochial authorities of St. Michan's, made an unsuccessful search for the bodies of Sir Patrick and Lady Dun, in the vault stated to have been purchased by the deceased knight for his own interment and that of his wife, and especially ordered by his will to have been closed; a direction which was found to have been entirely neglected; so ignorant, indeed, on this topic, were the persons in charge of the church, &c., that it was only on referring back to the church books in the years in which Sir Patrick and Lady Dun had respectively died, that it was made apparent to the parish officers of St. Michan's that the couple in question had been interred below the church."—"A Short Memoir of James Young, &c." (*op. supr. cit.*) note G., p. xii.

[b] Book of Electors Proceedings.

Pat. Dunn about the study of medicine." Testator everywhere calls it a professorship which he wished to establish in the College of Physicians. In Edinburgh the proportion of medical students desiring degrees to those who did not [*i.e.* those wishing licences only] was "about 24 to 300."

This committee adjourned to 27th June next; but no report appears to have been given. After some delay the Act already referred to was passed. This statute changed the University lectureships of anatomy and chirurgery, chemistry, and botany, into professorships, and instead of the professorships previously established it constituted the following:—Institutes of Medicine, Practice of Medicine, Materia Medica and Pharmacy, Natural History, and, contingently, Midwifery. It also made provision for clinical lectures, and for support of Sir P. Dun's library. This act was (*inter alia*) intended to remedy abuses which existed with reference to the discharge of the professorial duties. In the records of a Committee of the House of Lords, which sat on 22nd July, 1756, it appeared from the evidence of Dr. Anthony Relhan, president, and Dr. Barbor, vice-president, of the College, that no lectures had been read as provided by statute. The first professors under the 25 of Geo. III., cap. 42, were appointed in March, 1786. They were:—

Institutes of Medicine—Stephen Dickson.
Practice of Medecine—Edward Brereton.
Materia Medica and Pharmacy—Edmund Cullen.

The other professorships do not appear to have been filled up.

In 1791 a Committee of the House of Commons was appointed to consider the best mode of promoting the execution of the Act for Establishing a School of Physic, so far as it relates to Clinical Lectures (B. 94, von). It met 26th March, 1791, Right Honble. Secretary of State in the chair. Drs. Brereton, Percevall, Stephen Dickson, and Edward Cullen, examined.

The committee reported that an hospital ought to be built, and that the College of Physicians should be empowered to do it; and they recommended a bill to this effect to be brought in. This was done; and a further statute was passed in the 35th of Geo. III. empowering the College to raise £1,000 on Dun's estates to build an hospital. The construction of the 25 Geo. III., on which this was based, was contested at law by the professors; and so nothing came of this last statute.

On the 15th of April, 1799, a committee of the Irish House of Lords was appointed to enquire into the application of Sir P. Dun's funds, and to report how far it is consistent with the public good and with the faithful discharge of the intentions of the testator that the appropriation of the said funds should remain any longer in the College of Physicians. This committee met; and as there is even now considerable diversity of opinion on this question, I subjoin extracts from the evidence on which its report was based :—

Dr. Perceval was examined, and deposed that he did not think the College had faithfully discharged the trust or the intentions of Dun. He stated that the surplus had been applied "partly in purchasing books, partly in the payment of the library porter, and attendance upon the library." The largest number of patients admitted to the temporary hospital[a] was 33; the smallest, 1; the average, 13. He did not think the College should continue to dispose of Dun's funds, except under the control of visitors, and by the exclusion of interested persons from their body. Dr. Harvey stated that there were then no regular courses of lectures given. In reply to the query, "Could any useful or extensive course of lectures be applied to the case of one patient?" the following replies were given :—

A. "Dr. Plunket.—I think not.

"Dr. Cullen.—Certainly not.

"Dr. Harvey.—Yes; if a very curious case?"

It was further deposed that the annual support of each hospital bed in Dublin in 1799 was £15; and that the annual salaries of the King's Professors were then £300. Drs. Hopkins, Cullen, and Harvey agreed that the application of Dun's funds to a medical library was in accordance with the intention of the legislature, with Dun's will, and for the promotion of the study of physic. The following query and replies bear on the present state of the School of Physic :—

Q. "If the two studies of surgery and physick were united, and an establishment made for both under one roof, don't you conceive it would tend most materially to extend the knowledge of physic, and be highly beneficial to the nation under wise and proper regulations?

A. "Dr. Hopkins—I do think it would.

"Dr. Cullen.—I do, and accordingly it has been begun by grafting it on Mercer's Hospital.

"Dr. Harvey.—I do not think myself competent to answer this question."

The following is the report of the Committee :—[b]

April 18th, 1799, Committee met.
Earl of Altamont in the Chair.
Present :—Earl of Mayo, Lord Tullamore.

The following report of the examination and inquiry into the application of the funds bequeathed by Sir Patrick Dun was agreed to :—

My Lords,—The Lords Committees appointed to examine into the application of the funds bequeathed by Sir Patrick Dun for the establishment of an hospital for clinical lectures,[a] and to report the same, as they shall appear to them, to this house, have met and made a minute inquiry into the matter to them referred, and after an investigation of the books of the College of Physicians, and the examination of the most respectable members of said college,[b] as well as of the Professors of Physick by them chosen, whose testimony is now submitted to your Lordships, it appears clearly that the intentions of Sir Patrick Dun, as explained by the Acts of the 25th and 31st of the present reign, have not been carried into effect, and, by the unanimous admission of every witness examined, the trust confided in the said College of Physicians to have been grossly abused.

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[a] Of this more hereafter.

[b] Committee book, No. 9. Index to Irish Parl. Records. Com. books and papers. Charities Bundle 8, press M., shelf 4.

It appears to your Committee that by the 31st of the present King it is provided that salaries from the funds of Sir Patrick Dun shall be paid to the three professors at the rate of one hundred pounds each, and no more, and that the surplus of the income of said estate, which exceeded one thousand pounds a-year after paying the said three professors, should be applied to the establishment and support of an hospital as the best means of extending the knowledge of medicine by uniting the practice to the theory of physic.

It appears to your Committee that the salaries to the said three professors, at one hundred pounds a-year, and no more, has been regularly paid, but that though no hospital has been permanently established, nor any more than a very small sum applied to the support of patients, the only balance of the said surplus now forthcoming is £5 9s. 3d., though there ought to have been a balance of many thousand pounds.

In searching for the cause of said deficiency, it appears to your Committee, that many considerable sums have been expended by said College of Physicians, not at all warranted either by the intention of the testator or by the several acts of the Legislature before alluded to for carrying the same into effect; and among the said items unwisely and unwarrantably expended, your Committee hold themselves bound to notice a present of claret to the President of the College of Physick annually; an immoderate purchase of books, in some instances twice paid for; lawsuits carried on in which the said College were both plaintiffs and defendants, and actually paid from said funds the expenses of both; and loans to indigent members of said College, which were never repaid in many instances, and which, with other charges equally foreign to the said trust, have consumed the whole surplus income of Sir Patrick Dun's estates, which under wise and frugal management would have afforded means for a great and useful national establishment.

Your Committee being of opinion that there were funds abundantly

[a] Compare the terms of his deed.

[b] Dr. Hill in his pamphlet quoted below, arraigns the evidence as one-sided.

sufficient for such establishment, earnestly hope that the wisdom of the Legislature will put them under such Regulations as will faithfully discharge the benign intention of the testator, and most extensively benefit the public.

With reference to this report, which contains a flat contradiction to Dun's own words, as regards his intentions; I may say that, on perusal of the College journals, it is evident that there were two parties at this time in that body. Dr. Perceval, and those who sympathized with his views, were in the minority; and he seems to have resorted to legal means, on the failure of frequent attempts in the College, to carry his own views. At any rate, the College censured him for his share in this transaction; but yet he very soon after was elected President by them. His influence was very great, chiefly because he was supported by the authorities of the University, who thus created a bad precedent for their own interests; but whatever may be said for the success attending his efforts, one thing is quite clear, that the statute 40 Geo. III., cap. 84 (now known as the School of Physic Act), which was enacted in 1800, and was, I believe, almost the last act of the Irish Parliament (of which it was quite worthy), applied Sir P. Dun's funds in ways never intended by him—virtually transferred them from the body designed by him to two others which were never intended to profit by them, and introduced an unsound principle, by thus proving that no individual can safely leave his property for any public purpose.[a] Section 8 of this Act furnishes sufficient evidence on this point, by coolly transferring the property of one body to another.—

"And whereas a sum of one thousand two hundred pounds stands vested in the public funds of Great Britain, which belongs to the said College, and constitutes a part of the funds applicable by them to the purposes of their Institution; be it enacted that the said Commissioners [certain persons named in the Act to manage the building of Sir Patrick

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[a] From his will and deed it is manifest that he left his money to advance the position of his own profession by providing professorships of value which would raise their holders, and the calling of medicine, in the estimation of the public, and also raise the standard of medical education. So, indeed, Lady Dun says in one of her letters. He never contemplated the support of the sick poor; and the legal injustice done by forfeiting his funds (in great part) for the last-named purpose is much the same as if the greater part of the fund left by his friend Archbishop King to endow a Divinity Lecturer were given by Act of Pariament to build and endow churches in Dublin, because the fund was very valuable, and the lectures were irregularly given. On this subject see on one side, Dr. Dickson's "Letter to his Medical Brethren relative to the School of Physic." Dub., 1795; and Dr. Hill's "Address," and other pamphlets. Dub., 1803, 1805, and 1814; on the other side, Dr. Perceval's Account of Dun's Bequest Dublin, 1864. All are in the Library of Coll. of Phys.

Dun's Hospital] shall be, and they are hereby empowered to cause the said stock to be sold for the best price which can be had for the same, and to apply the produce to the like purpose of building and completing such Hospital."

According to Dr. Osborne's *Annals of Sir Patrick Dun's Hospital*, this was actually done.

The School of Physic Act of 1800 is the statute under which Dun's property is now administered; and it is generally called by the above title, because it has reference to other matters than Dun's estates, and chiefly to the constitution and regulation of that medical corporation or college which is therein entitled "the School of Physic," but which is commonly and incorrectly confounded with the Medical School of the University. The bill was read for the first time in the House of Commons, on 2nd July, 1800; for the second time, on the 4th, on which day it was committed. It passed through committee, and was reported on the 8th; was read for the third time and passed on the 9th; was returned to the Lords and assent given out Aug., 1800.[a]

In order to give a clear view of a somewhat complex question I may briefly recapitulate the corporate and legislative transactions in regard to Sir P. Dun's Will.

By his will he directed that his intentions as expressed in his "deed" already given, should be carried into effect. This was partly done by authority of a Royal Charter which was, in effect, nothing more than giving an official stamp to Dun's will.

This was succeeded by the Act passed in the 15th year of Geo. II., which also adhered to Dun's will, except in two important particulars:—1. It provided that his intentions respecting the teaching of anatomy, botany, &c., need not be carried out, inasmuch as the university had made provision for this part of a medical education; and 2. It increased the number of professors beyond those contemplated by Dun, to meet what was certainly a pressing want at the time. On this latter fact I may observe, that the Legislature and the College of Physicians by appointing a Professor of Chirurgery and Midwifery, carried out the old idea, which is becoming fashionable again in our own day, that chirurgery and midwifery were parts of physic, not separate professions; and, it will be borne in mind that these professors were appointed to teach students *in physic, surgery, and pharmacy.*

The Act of the 25th of Geo. III., altered and amended the Act before mentioned, chiefly by abolishing the Professorship of Chirurgery and Midwifery, and by instituting instead of it one of the Institutes of Medicine, and one of Natural History. The Act of the 31st of Geo. III., amended the last mentioned statute chiefly in respect of that part which related to clinical lectures; but the Act of 40th Geo. III., cap. 84, repealed all the preceding statutes on the same subject, *except* a portion of the statute of the 15th Geo. II.; and, as this Act was never printed, among the statutes, I subjoin those portions of it which are yet unrepealed.

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[a] Vol. xix. of Journals.

Among the enactments regarding the examinations for selections of professors is this clause :—

> " And be it further enacted by the authority aforesaid that if, upon any election of the professor or professors aforesaid, there be any person among the candidates who shall be lineally descended from the aforesaid Patrick Dun, of Taerty,[a] and shall be attested to be so by certificate under the hand of the Provost Baillies and Council of Aberdeen in North Britain, and the Ministers of Aberdeen for the time being, and who, on such examination as aforesaid, shall be found to be equally qualified with any of the other candidates for the said professorship or professorships, and shall be so reported by the examinators aforesaid, such person or persons shall have the preference before any other of the candidates, and shall be by them declared duly elected into the said professorship or professorships; and such person or persons, so reported and declared, are hereby respectively declared to be the professor or professors within this Act; anything herein contained to the contrary thereof, in anywise notwithstanding, and the [that ?] next to those descended from the said Patrick Dunn the like preference shall be given in like manner to any other candidates who shall be examined and reported equally qualified as aforesaid, who shall be lineally descended from the first, second, and third sisters of the said Sir Patrick Dunn,[b] the issue of the eldest and their issue being always to take place of the issue of the youngest and their issue; such descent from the said sisters of the said Sir Patrick Dunn to be certified and attested as the descent of the said Patrick Dunn of Taerty is hereby directed; and the like preference in like manner shall be next given to such candidate as shall be lineally descended from the said John Jepson; and after them to such as shall be lineally descended from the said William Jepson; and next to them, to such as shall be likewise lineally descended from the said Elissia Reader, sister of the said Dame Mary Dunn, and wife of the said Enoch Reader, deceased; and lastly, to those descended from the said Murrogh Lord Viscount Blessington, in the order and precedency and according to the priority of their respective nominations as they are last before mentioned herein and to no other."

In a book which I have previously quoted[c] it is stated " that the above-mentioned right of preference enjoyed by the parties referred to in the deed of Sir Patrick Dun [and confirmed by Royal Charter, and by Statute of 15 Geo. II. just quoted] was fully recognised by the authorities of the hospital, when in the Winter of 1831–32 the late William Ross, M.D., son of John Leith Ross, of Arnage, and Mrs. Elizabeth Young, of Bourtie—the latter a great granddaughter of Mrs. Elizabeth, or Bessy, Dun—was for a period extending over several months following his medical studies in the Irish capital."

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[a] Sir Patrick Dun's cousin mentioned in his Will.

[b] See notes to the will.

[c] Memoir of James Young, &c.—Note G.

I have searched the hospital records in vain for any confirmation of this statement; but I find that a Mr. Charles A. Ross is entered in the pupil's book as having paid his fees to the hospital on the 1st of November, 1834.

Regarding Dun's Library the following clause of the same Act is still in force:—

> "And as to and concerning the library of books, part of the said personal estate of the said Sir Patrick Dun, so vested in the said College of Physicians as aforesaid. Be it enacted, by the authority aforesaid, that the said President and Fellows of the College of Physicians in Ireland shall, with all convenient speed, by and with the consent of the said Archbishop of Dublin then being, and any two of the said professors, deposit and place the same in some convenient place in or near the said City of Dublin, for the use of the said College of Physicians, and of all the said professors and their successors, subject to such conditions, rules, regulations, and directions for the safe custody and good usage of the said books, as by the said Archbishop of Dublin, the said President and Fellows of the College of Physicians in Ireland, and any two of the said Professors, by deed or instrument in writing, under the common seal of the said college, and under the hand and seals of the said archbishop and professors, shall be limitted, appointed, and established concerning the same."

THE SCHOOL OF PHYSIC.

"The School of Physic in Ireland" is a medical corporation or college, governed by the Statute of the 40th Geo. III., the contents of which are well known to all concerned. It consists of the Professors of Anatomy and Chirurgery, of Chemistry, and of Botany, on the University foundation, appointed by the Provost and Senior Fellows of Trinity College; of the King's Professors of the Institutes of Medicine, of the Practice of Medicine, and of Materia Medica and Pharmacy, on the foundation of Sir Patrick Dun, practically appointed by the President and Fellows of the College of Physicians, as provided in the School of Physic Act;[a] and of such students as shall matriculate with the Registrar of Trinity College.

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[a] There are five electors; the Provost of T.C.D.; the Regius Professor of Physic; and three (the majority) chosen by the College of Physicians.

To this Statutable foundation the University has added a Professor of Surgery, an Anatomist, and an Assistant Anatomist, all on the foundation of Trinity College; and the College of Physicians has added a Professorship of Midwifery and the Diseases of Women and Children; and also a Professorship of Medical Jurisprudence. As soon as the Governors of Sir P. Dun's Hospital are able to support 100 patients, the Professorship of Midwifery will become a King's Professorship on the same foundation as the others of the same name.

Full details of the working of the School of Physic, and of the succession of the University professors and lecturers, will be found in the Dublin University Calendar; the following is the list of professors on Dun's foundation, and of those founded by the College of Physicians:—

PRACTICE OF PHYSIC.

Robert Griffith, . .	Elected 1717.
James Gratton, . .	„ 1719.
Henry Quin, . .	„ 1749.
Edward Brereton, . .	„ 1786.
Stephen Dickson, . .	„ 1792.
Whitley Stokes, . .	„ 1798.
Martin Tuomy, . .	„ 1812.
Chas. R. A. Lendrick, . .	„ 1832.
George Greene, . .	„ 1841.
John Thomas Banks, . .	„ 1846.

CHIRURGERY AND MIDWIFERY.

Nathaniel Barry, . .	Elected 1749.

MATERIA MEDICA AND PHARMACY.

Constantine Barbor, . .	Elected 1749.
Edmund Cullen, . .	„ 1786.
John Crampton, . .	„ 1804.
Jonathan Osborne, . .	„ 1840.
Aquilla Smith, . .	„ 1864.

INSTITUTES OF MEDICINE.

Stephen Dickson, . .	Elected 1786.
John Wm. Boyton, . .	„ 1812.
William Stack, . .	„ 1826.
Robert James Graves, . .	„ 1827.
Robert Law, . .	„ 1841.

NATURAL HISTORY.—None appointed.

MIDWIFERY (COLLEGE FOUNDATION).

William Fetherstone Montgomery, .	Elected	1827.
Fleetwood Churchill, . .	,,	1856.
Edward Burrowes Sinclair, . .	,,	1864.

MEDICAL JURISPRUDENCE.—(College Foundation).

Thomas Brady, . . .	Elected	1839.
Robert Travers, . . .	,,	1864.

NOSOCOMIUM PATRICII DUN. EQ. AUR.

(*Sir Patrick Dun's Hospital.*)

Sir Patrick Dun's Hospital was founded by the School of Physic Act in 1800, and is now governed by the directions laid down in that statute.

For several years previous to its erection, great inconvenience was felt from the want of clinical lectures in connexion with the School of Physic; and several temporary expedients were resorted to to remedy this defect. The statute 25 Geo. III., provided that until a hospital should be built, clinical lectures might be given in some hospital in Dublin. Accordingly, on the 14th of January, 1788, the College of Physicians to some extent fulfilled the spirit of the law by taking a house in Clarendon-street for a clinical hospital. After a time this had to be given up, chiefly on the score of expense, a committee reporting to the College, on the 14th of August, 1790, that the cost of maintaining the institution was much higher than in other hospitals in Dublin—the cost of drugs alone being *eight times as high* as at other hospitals. On the 8th of November, 1790, the furniture of the hospital in Clarendon-street was ordered to be removed to Mercer's Hospital: and in case it could not be there accommodated, further directions were given to remove it to Stevens' Hospital. On the 9th of July, 1792, a lease of a house on Blind-quay was accepted by the College for an hospital. This was called Sir Patrick Dun's Hospital, and was put in working order for thirty clinical patients on the 27th of September in the same year. This institution seemed to work for a short time only, for, on the 16th of February, 1793, the College took into consideration the appointment of a Physician-in-Ordinary to Sir P. Dun's Hospital in Lower Exchange-street. According to the College journals, this was working in 1797; and on the 21st of January, 1799, Mercer's Hospital was reported ready for the reception of clinical patients on Dun's foundation. The College and the Governors of Mercer's Hospital did not pull well together.

At first the hospital in Lower Exchange-street was kept open during the whole year, then only during a part of the year; next, the patients decreased in number, until, finally, it would appear from the evidence given before the Lords' Committee in 1799, that at one time only one patient was to be found in it.[a]

By the statute 31 Geo. III., the College was empowered to raise £1,000 to build an hospital; but, as already stated, the professors contested the construction of this Act, and so nothing was done in that way until after 1800, when the School of Physic Act gave more clear and extended powers.

By this Act the building of the hospital was entrusted to eight Commissioners, viz., the Right Honourable Sackville Hamilton, the Provost of Trinity College, and the President of the College of Physicians for the time being, Sir Francis Hutchinson, Baronet, the Hon. George Knox, Dr. Arthur Browne (LL.D.), William Digges Latouche, and Abraham Wilkinson, Esquires. These Commissioners were directed by the Act to "appropriate" the £1,200 already mentioned, belonging to the College of Physicians, together with the rents which should be collected (minus payment of certain fixed charges), until accommodation should be afforded for thirty patients. They selected a lot of ground in Grand Canal-street, of which a lease for 998 years was granted to the President and Fellows of the College of Physicians, from David Courtenay, Esq. The College seal was affixed to this lease on the 10th of May, 1862. "Having in 1808 expended £6,346 of Sir Patrick Dun's funds in the erection of the west wing of the hospital, and in enclosing the ground, and making sewers, and, being destitute of any means for carrying on the building, except the annual produce of the estates, which was quite inadequate, an application was made for Parliamentary aid, and in the ensuing session they obtained a grant of £6,204 for the purpose of finishing the wing then erecting, and for procuring, furnishing, and maintaining a temporary hospital."[b]—Osborne's *Annals.*

On the 24th of June, 1808, the west wing being finished, and capable of affording accommodation to thirty patients, the Commissioners summoned a Board of the Governors nominated in the School of Physic Act, and delivered up to them the management of the institution.

By the aid of subsequent Parliamentary grants the hospital was completed, and accommodation was provided for the Professors on Dun's foundation, who lectured there from that time until a few years ago—for the students, for Dun's library, and for the Convocation Hall of the College of Physicians. The building of the hospital was commenced in

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[a] This record of the various attempts at clinical instruction has been taken from the College Journals, and from the pamphlets of Drs. Dickson, Hill, and Perceval, already noted. The hospital of Blind Quay is not noticed by these gentlemen; and wherever any discrepancy occurred in the accounts, I have followed the minutes of the College of Physicians.

[b] See Report on certain Charitable Establishments in the City of Dublin, which received Aid from Parliament. Dublin, printed by Grierson in 1809.

1803, and was completed in 1816, and the first College meeting there took place in 1818. The Board of Governors consists of the Visitors of the College of Physicians; the President, Vice-President, and Censors of the same; the Provost of Trinity College; and of twelve other persons chosen by the *ex-officio* Governors from among the subscribers to the hospital.

The elected Governors are annually chosen, in March; and though the annual election does not appear to be required by the Act, yet it has been the invariable custom. In point of fact, however, it does not make any material difference, as it is usual to re-elect the same persons from year to year, during their lives. "No Physician or Surgeon who shall attend Patients [in the hospital], shall be capable of acting as a Governor of the said hospital."—40 Geo. III., cap. 84, sec. 4.

During the last two years the College has given over to the Governors the entire use of the central portion of the building, with a view to the conversion of the hospital into a medico-chirurgical institution, a change which was considered desirable for the improvement of the School of Physic, medical cases only having been admissible previous to this alteration. This change has been attended with the best results, and has contributed, in some degree, to carry out the intention of Sir P. Dun, who—as appears from his will and deed—considered surgery to be a part of medicine, an educated view of the subject which Hippocrates and the ancients entertained, and which the strides of modern medical science have shown to be the correct view. So long ago as the 16th of February, 1793, physicians-in-ordinary were recommended to be appointed to attend patients in the temporary Dun's Hospital in Lower Exchange-street, and this usage has been maintained almost to the present time. In consequence, however, of the conversion of the entire hospital to clinical purposes under the late arrangement, the clinical professors who, previously, had only attended cases selected for clinical purposes, will, in future, have charge of the whole hospital; and the office of Physician-in-Ordinary will terminate with the term of years for which each of the present holders, Dr. Henry Kennedy and Dr. William Moore, was appointed.[a]

The intention of the School of Physic Act was that the University Medical Professors named therein, and those on Dun's foundation, should be also clinical teachers, in accordance with the then fashionable Scotch system, which was further complied with in the adoption of their medical "session" into our school of physic instead of the university "terms," previously in use in Irish medical education, as in that of the other professions. If all the professors were chosen with this view it would answer well; but it is not to be expected in the present state of science that a man chosen specially to teach chemistry or botany should, as a matter of course, be a good clinical teacher also. Nor, on the other hand, can it be expected that the best teachers of these and other important sciences accessory to medicine should be at the same time the men best fitted to give clinical instruction.

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[a] For the list of Physicians in Ordinary, and Extraordinary, and also the lists of all the other officers of the hospital, see a MS. vol., "Tables of Useful and Interesting Memoranda concerning Sir Patrick Dun's Hospital," which is in the custody of Mr. Joseph Mullen, the Registrar.

Among the numerous pupils of Sir P. Dun's Hospital, the following, from 1827 to 1849, are well known to the profession.—See Pupil's Book.

Henry L. Dwyer.
William Barker.
Robert W. Smith.
John T. Banks.
Fleetwood Churchill.
George Green.
Robert John Kane.
Hans Irvine.
Robert Bentley Todd.
Charles Lever.
Aquilla Smith.
Alfred Hudson.
M. H. Stapleton.
Denis Chas. O'Connor.
Eugene Finn.
Thomas Brady.
Cathcart Lees.
John Popham.
James F. Duncan.
Robert Travers.
William Reeves.
Horace T. N. Meade.
Wm. E. Steele.
Henry Kennedy.
Robert D. Lyons.
Edward B. Sinclair.
Maurice H. Collis.
Lombe Atthill.
Armstrong Todd.[a]

SIR PATRICK DUN'S LIBRARY.

"Bibliotheca Patricii Dun, Equitis Aurati," was founded in 1711, by the will of Sir P. Dun, who bequeathed his books to the college; and this bequest was subsequently confirmed by the Act of Geo. II., the special clause of which referring to this subject I have already given in full; as it is still in force. In the clause aforesaid the books are stated to be for the use of the president and fellows and of the professors on Dun's foundation. By the statute 25 Geo. III., cap. 42, part of the surplus funds of the trust estate were directed to be used "for purchasing medical books for the use of the students in physic" (sec vii.), and considerable sums were expended from time to time in pursuance of this enactment. The School of Physic Act, 40 Geo. III., cap. 84, wholly repealed that of 25 Geo. III., cap. 42, and did not substitute any corresponding clause; but the equitable principle therein contained, viz., the right of students of the school of physic to use Dun's library, has all along been admitted by the president and fellows, who have never ceased to admit to the library, under certain conditions, those who have matriculated in that school according to statute.

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[a] This list, taken from the Pupil's Book, is very incomplete.

As already stated, the School of Physic Act of 1800 placed it in its present position, and under that statute, and the unrepealed portion of the 15th of Geo. II., it is now supported and governed. The Act of 1800 does not directly provide for its support out of Dun's estate, further than by providing for a librarian and some minor matters; but from 1800 to the present time a small annual grant for purchasing books and paying a library servant has always been made by the college, and allowed by the visitors, under the head of "other matters incident to the school of physic," to which, according to sec. 4 of the Act, part of the surplus of the estate may be applied.

For some years after Sir Patrick's death the library remained in his house, which was used by the college as their place of meeting. Before a Committee of the House of Lords on the 22nd of July, 1756, the following evidence was given:—

"Q. Archbishop of Dublin.—What is become of the library of Sir P. Dun?

"A. Dr. Anthony Relhan.—The remains of them [are] in the possession of Dr. Quin, as they have no other place.

"Q. Have they any catalogue of the books?

"A. Yes; they have.

"Q. How many books are there?

"A. About 300.

"Q. If any security was ever given for the forthcoming of the books?

"A. It was never required."

By a subsequent statute the books were directed to be removed to a room in Trinity College, where they remained until 1815, when, in accordance with the provision of the act of 1800, they were again removed to an apartment provided for them in the hospital. When the new college premises were opened in Kildare-street, in 1864, it was deemed advisable to have the library placed there; and as the Act of 1800 did not direct that they should be permanently placed in the hospital, while that of 1743 directed their removal to "some convenient place in or near the City of Dublin," they were removed to their present more useful and "convenient" position in the Summer of 1865.

From the Lords' Committee report of 1799 it would appear that great abuses had existed in regard to this library; but these have long disappeared.

On the 14th of August, 1787, the first library regulations appear to have been made. They are given at length in the College journal of that period; and at the same time £18 a year was allowed for a library porter, as well as considerable sums for purchasing lecture apparatus for the use of the King's professors.

At first one of the King's professors filled the office of librarian; but subsequently this office was filled by one of the fellows. The following is a complete list of the librarians:—

Stephen Dickson,	Elected	19 Sep., 1787.
John Wm. Boyton,	„	23 May, 1797.
Hugh Ferguson,	„	18 Oct., 1808.
Peter Edward M'Loughlin,	„	18 Oct., 1815.
Francis Hopkins,	„	19 Apr., 1819.
Edward Hill,	„	22 Nov., 1819.
Thos. Herbert Orpen,	„	18 Oct., 1826.
Samuel Litton,	„	18 Oct., 1833.
John O'Brien,	„	18 Oct., 1840.
Geo. Alex. Kennedy,	„	5 Jan., 1846.

None but a fellow was ever chosen to this office; but since 1800 the fellow so elected had, at once, to vacate his fellowship in accordance with the terms of the School of Physic Act.

Up to the Summer of 1864 it was only a lending library, but on the death of Dr. Kennedy, which occurred in 1865, it was resolved to convert it into a reading library also. Accordingly the position of librarian had to be modified. A layman was elected to the office of librarian on Sir P. Dun's foundation, with duties similar to those usually discharged by the assistant librarians in our large public libraries. In addition the College created the office of Honorary Librarian, which was intended to be filled by one of the fellows, who need not resign his fellowship; and who should have the position and duties of senior or chief librarian in our large public libraries. The title "Honorary" was given to denote that the holder received an *honorarium*, or fee, for his services from the college private funds, as distinguished from the librarian who receives a *salary* from the trust estates.

On the 8th July, 1865, the College elected—

Hon. Librarian—T. W. Belcher.

Librarian on Dun's foundation—H. J. Fennell.

The library was opened in the new College in October, 1865, and it is open daily from 10 a.m. to 6 p.m., Sundays and a few other days excepted.

In the convocation hall of the College of Physicians may be seen a fine portrait of Sir P. Dun in the robes of a Doctor in Physic, painted by Sir Godfrey Kneller. The accompanying engraving, by Mr. W. H. Lizars,[a] gives a very good idea of it, and also a *fac simile* of Dun's signature. Professor Osborne, in his Annals of the Hospital, mentions another portrait of Dun which was in possession of John Leith Ross, Esq., of Arnage, in 1844.

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[a] This first appeared in the Dublin Quarterly Journal in 1846.

The picture of Sir Godfrey Kneller was presented by Peter Walsh, Esq., of Belline, and arrived in Dublin on the 14th of July, 1817. In the College Journal, under that date, appears a copy of the following certificate:—

"I certify that the portrait which I have the honour of presenting to the College of Physicians in Ireland is a genuine (copy) and original portrait of Sir Patrick Dun. It remained many years among the family pictures in the possession of the representative of Lady Dun's sister (who survived her), and remained so when I procured it from a person that obtained it from Mrs. Jepson, the widow of a grandnephew of Lady Dun. The picture itself bears internal evidence of its authentictity.

"Belline December 12th—1816.

"PETER WALSH."

It may be well to give a short summary of a few facts connected with the College history from Dun's time to the present. Repeated efforts, commencing in 1695, were made by the College to get the charters of William and Mary confirmed by statute. These were petitioned against, mostly by the apothecaries, and invariably defeated.[a] Several statutes were, however, passed during the 18th century, which had the effect of confirming the most important parts of the charter; and for a more particular account of them I must refer the reader to my Historical Introduction to the College Register for the present year. On the 23rd September, 1698, the Fellows were ordered to meet on Wednesdays and Fridays, at 8 p.m., at "St. Laurence's Coffee House, during next session of Parliament."

From the temper of the times, and the previous history of the College, it was to be expected that some Fellows under the Old Charter were excluded by the new; indeed this is implied on the preamble of the latter.[b] Accordingly, in the Journal of 15th April, 1700, it was resolved:—"That it be considered at next solemn meeting how ye fellows of ye Colledge shall behave yurselves towards such physitians as have been of ye former Charter and towards papist physitians."[c]

[a] See Dr. Moore (W. D.) "On the History of Pharmacy In Ireland" (Dub. Qu. Journ., Aug., 1848). This is one of the most interesting of Dr. Moore's many and valuable papers.

[b] Sec. 3.

[c] Nothing seems to have come of this notice of motion. This probably occurred through the influence of Dun, who in the matter of Dr. Crosby, already detailed, and in other things, took a more liberal view.

In the Lords' Committee Report, which preceded the passing of the Act, 1800, it was complained, among other abuses, that part of Dun's money was spent in buying claret for the President. Regarding this, it appears that the first hogshead of claret was ordered for President Harvey on the 27th of September, 1792; and on the 15th of December, in the same year (being the centenary of their incorporation), the College dined at Keane's house in Kildare-street. For many years after 1800 the system of giving each president £100 for claret for entertaining the Fellows during his year of office prevailed; but from the beginning of the present century this sum was granted from the private funds of the College.

From 1654 to 1692 the Fraternity, or College, occupied Trinity Hall; for some years after the latter date they occupied Sir P. Dun's house on the Inn's-quay; at a subsequent period their meetings were held at a house in Sackville-street, and later in the house of the President for the time being. As already stated, they occupied part of Sir P. Dun's Hospital from 1818 to 1864, when they removed to the new buildings in Kildare-street. The foundation stone of these buildings was laid on Monday, 7th of July, 1862, by the late Earl of Carlisle, when Lord Lieutenant, during the presidency of Dr. (now Sir Dominic) Corrigan, to whose exertions the erection of these buildings is in a great measure due. The last meeting in the Convocation room at Sir P. Dun's Hospital was held on Friday, the 1st day of July, 1864; and the first meeting was held in the new buildings on the Tuesday following.

The bi-centenary of the incorporation of the College will fall on the 8th of August, 1867.

BOOKS RECEIVED, AUGUST, 1866.

1. Lectures on mental diseases. By W. H. O. Sankey, M.D., &c. London: Churchill, 1866. 8vo, pp. 281.

2. A handy book of ophthalmic surgery, for the use of practitioners. By J. Z. Laurence, F.R.C.S., &c., and Robt. C. Moon, with numerous illustrations. London: Hardwicke, 1866. 8vo, pp. 160.

3. On inhalation as a means of local treatment of the organs of respiration, by atomized fluids and gases. By Herman Beigel, M.D., L.R.C.P.L., &c. London: Hardwicke, 1866. 8vo, pp. 200.

4. Surgical appliances and minor operative surgery. By Thos. Annandale, F.R.C.S., Edin., &c. Edinburgh: Maclachlan and Stewart. Fcap, pp. 246.

5. A practical treatise on the diseases of the testis, and of the spermatic cord and scrotum. By T. B. Curling, F.R.S. Third edition, revised and enlarged. London: Churchill, 1866. 8vo, pp. 609.

6. Dictionaire encyclopédique des sciences médicales. Tome 4^{me}. Première partie. Amp-Ane. Paris: Asselin, 1866. 8vo, pp. 384.

7. On the curability of certain forms of insanity, epilepsy, catalepsy, and hysteria, in females. By Baker Brown, F.R.C.S., &c. London: Hardwicke, 1866. Post 8vo, pp. 85.

8. On the safe abolition of pain in labour and surgical operations by anesthesia with mixed vapours. By Robt. Ellis, Surg. Accoucheur to the Chelsea, Brompton, and Belgrave Dispensaries. London: Hardwicke, 1866. Crn. 8vo, pp. 80.

9. Cholera in its home, with a sketch of the pathology and treatment of the disease. By John Macpherson, M.D. London: Churchill, 1866. Post 8vo, pp. 155.

10. Eighth annual report of the general board of commissioners in lunacy for Scotland. Blue book, 1866. 8vo, pp. 266.

11. On the use of the sphygmograph in the investigation of disease. By B. W. Foster, M.D., &c. London: Richards, 1866. Fcap, pp. 32.

12. On dropsy, and its connexion with disease of the kidneys, heart, lungs, and liver, as well as on some other diseases of those organs without dropsy. Illustrated by numerous drawings from the microscope. By W. R. Basham, M.D., &c. Third edition, enlarged, revised and rearranged. London: Churchill, 1866. 8vo, pp. 437.

13. Brief remarks on cholera, being the result of observations during the two last outbreaks of cholera in England, and an attempt to advance a theory of that disease which shall lead to a more consistent method of treatment, to which is added a short table of practical rules for general use during an epidemic. By Robt. J. Spitta, M.D. London: Churchill, 1866. 8vo, pp. 15.

14. The royal London ophthalmic hospital reports and journal of ophthalmic medicine and surgery. April, 1866. London: Churchill.

15. Gout and rheumatism in relation to disease of the heart. By A. W. Barclay, M.D., &c. London: Churchill, 1866. Post 8vo, pp. 214.

16. Defects of sight and hearing, their nature, cause, prevention, and management. By J. Wharton Jones, F.R.S., &c., &c. Second edition. London: Churchill, 1866. Fcap., pp. 168.

17. The common nature of epidemics, and their relation to climate and civilization. Also remarks on contagion and quarantine. From writings and official reports by Southwood Smith, M.D., &c. Edited by J. Baker, Esq. London: Trübner, 1866. 8vo, pp. 130.

18. The physiological anatomy and physiology of man. By R. B. Todd, Wm. Bowman, and Lionel Beale. A new edition by the last-named author. London: Longmans, 1866. 8vo, pp. 155.

19. Notes on health in Calcutta and British emigrant ships, including ventilation, diet, and disease. By W. H. Pearse, M.D. London: Churchill, 1866. Fcap., pp. 160.

20. The principal baths of France considered with reference to their remedial efficacy in chronic disease. By Edwin Lee, M.D., &c. Fourth edition. London: Churchill, 1866. Fcap., pp. 154.

21. The true and the false sciences. A letter on homeopathy. London: Churchill, 1866. 8vo, pp. 40.

22. Recent advances in ophthalmic science. The Boylston prize essay for

1865. By H. W. Williams. Boston: Ticknor and Fields, 1866. Post 8vo, pp. 166.

23. On the function of articulate speech, and on its connexion with the mind and the bodily organs. Illustrated by a reference to recent observations on certain diseased states of the brain. By W. T. Gairdner, M.D., &c. Glasgow: Bell and Bain, 1866. 8vo, pp. 54.

24. Atlas of surgical and topographical anatomy. By J. Béraud. Illustrated by 100 plates, drawn from nature, by M. Bion. Translated by Robt. Thos. Hulme, M.R.C.S. Eng. London: Baillière, 1866. Nos. 1 and 2.

25. The anatriptic art. A history of the art termed anatripsis by Hippocrates, tripsio by Galen, frictio by Celsus, manipulation by Beveridge, and medical rubbing in ordinary language, from the earliest times till the present day, followed by an account of its rare virtues in the cure of diseases and maintenance of health, with illustrative cases. By Walter Johnson, M.B. London: Simpkin and Marshall, 1866. Fcap., pp. 122.

26. On the use of the sphygmograph in the investigation of disease. By B. W. Foster, M.D., &c. London: Churchill, 1866. 8vo, pp. 42.

27. Tapeworms, human entozoa, their sources, nature, and treatment. By T. Spencer Cobbold, M.D., F.R.S., &c. London: Longmans, 1866. Fcap. 8vo, pp. 83.

28. On railway and other injuries of the nervous system. By J. E. Erichsen, F.R.C.S., &c. London: Walton and Maberly, 1866. Post 8vo, pp. 144.

29. The British journal of homeopathy. No. XCVII.

30. Gleet, its pathology and treatment, with a memoir on the treatment of stricture of the urethra by subcutaneous division. By H. Dick, B.A., M.D. Second edition. London: Hardwicke, 1866. 8vo, pp. 113.

31. Supplementary report on the mortality experience of the Scottish equitable life assurance society from 1831 to 1864, being a period of thirty-three years, with tables exhibiting the lives at risk and the average mortality of males and females at each year of life, also the average mortality from each cause of death at seven decennial periods of life, submitted to the board of directors. By Wm. Robertson, M.D., F.R.S.E., medical officer to the society. 1866.

32. Thirty-sixth annual report of the Belfast district hospital for the insane, 1866. 8vo, pp. 30.

33. Chemical addenda, being a brief exposition of the salient features of modern chemistry. By the Rev. B. W. Gisborne. London: Dutton, 1866. Fcap. pp. 23.

34. Sore throat, its nature, varieties, and treatment, including the use of the laryngoscope as an aid to diagnosis. By M. Prosser James, M.D. Second edition. Illustrated. London: Churchill, 1866. Post 8vo, pp. 155.

35. Idiocy, and its treatment by the physiological method. By Ed. Seguin, M.D. New York: Wood, 1866. 8vo, pp. 457.

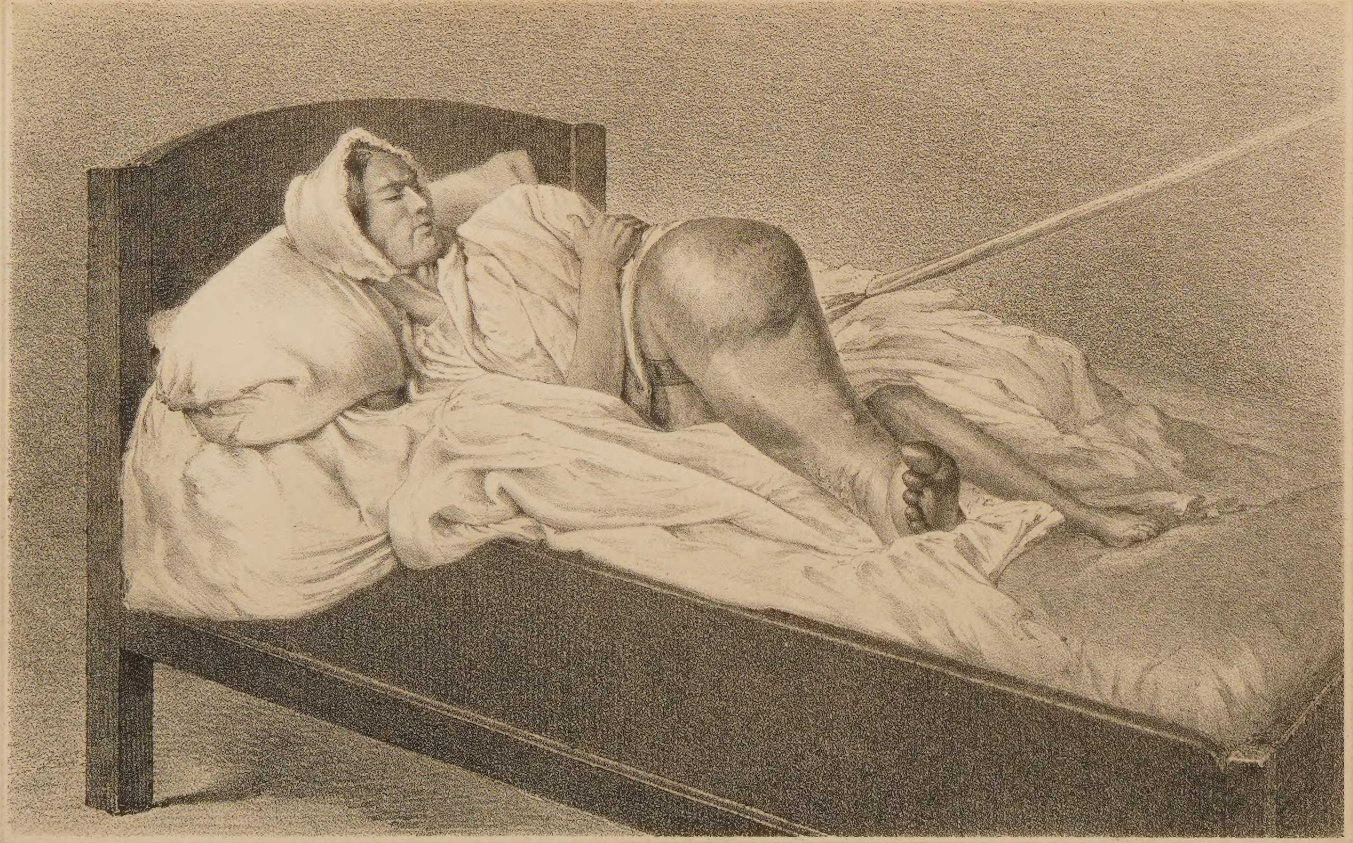
36. Clinical memoirs on the diseases of women. By M. G. Bernutz and M. E. Goupil. Vol. I. Translated and edited by A. Meadows, M.D., &c. New Sydenham society, 1866. 8vo, pp. 276.

37. Copy of the report of Dr. Edward Smith, LL.B., F.R.S., poor law inspector and medical officer to the poor law board in the methopolitan workhouse infirmaries and sick wards. Parliamentary paper. Fcap, pp. 216.

38. A winter in Paris, being a few experiences and observations of French medical and sanitary matters gained during the season of 1865–6. By Fred. Simms, M.B. London: Churchill, 1866. Fcap., 151.

39. Journal des maladies chroniques et de l'hydrothérapie combinée. Par Le Docteur Andrieux (de Brionde).

LIBRARY



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